'Ultramodern contraception' re-examined: cultural dissent, or son preference?

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Abstract

Literature on family planning considers natural (also called traditional) contraceptives to be 'ineffective' because its users are not motivated to control their fertility. While this is true for initial stages of fertility transition, studies have reported that it is women belonging to urban, educated and affluent households - propelled by a reaction against Western technology – who are the main users of natural contraceptives. This elite group has both the skill and knowledge to use such methods effectively. This has led to the coining of the term 'ultramodern contraception'.

This paper critically re-examines the 'ultramodern contraception' theory, and argues that it has certain limitations. Analyzing of three rounds of National Family Health Survey data for India, we argue that reliance on such methods may be a transient phase in the reproductive cycle of women, specifically before the desired gender parity of children is attained. Moreover, it is a manifestation of son preference.

Keywords: Contraceptive methods, Gender parity, Son preference, Natural contraception, Multinomial logit, India.

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1. Introduction

Family planning, or contraceptive, methods may be divided into three major groups. *Folkloric methods* consist of locally described or spiritual methods believed popularly to reduce fertility, but of unproven effectiveness. Such methods consist of herbs, amulets, gris-gris, etc. *Traditional, or natural, methods* consist of fertility preventing methods of proven effectiveness, like rhythm (or calendar) and withdrawal (*coitus interruptus*) methods.[1] Finally, *modern contraceptive methods* include hormonal methods (i.e., the pill, injectibles and implants), IUDs, male and female sterilization, condoms and invasive vaginal methods (e.g., the diaphragm and spermicides).

The literature on family planning considers natural contraceptives to be 'ineffective'[2] or 'unreliable' methods of family planning (Oddens, 1997; Zachariah et al., 1994). This is partly because the users of natural forms of birth control seem to be those least motivated to actually control their fertility or those least able to access more efficient forms of birth control (DeGraff and de Silva, 1991, 1996). Further, effective use of natural methods requires skill and knowledge of ovulatory cycles, considerably reducing the de facto effectiveness of such methods. This has led policy makers in developing countries to focus on the promotion of modern contraceptive methods.

[1] We shall use the terms traditional methods and natural methods interchangeably.
[2] Although traditional contraceptives are theoretically effective, in reality their success will depend upon the skill and knowledge of the users (Santow, 1993).

In India, for instance, one of the first developing countries to introduce family planning policies, there have been many twists and turns in the policy. However, the thrust on encouraging use of modern methods, particularly among the socio-economically vulnerable sections of the population has remained a persistent feature of the target-oriented, clinic-centered family planning policy in India (Visaria and Chari, 1998; Dyson, 2004; Santhya 2003; Vicziany 1982; Srinivasan 1998; Visaria 2000). This has had an impact on the usage pattern of contraceptive methods in the country. The third round of the National Family Health Survey (NFHS-3) reveals that 56 percent of currently married women use contraceptives, with 49 percent relying on modern methods. Among illiterate women the latter proportion is 46 percent, while a third of women belonging to the lowest wealth index quintile use modern methods. Further, use of natural methods is low, accounting for just about 8 percent of current contraceptive use (International Institute for Population Sciences (IIPS) and Macro International 2007).

Regional analysis, however, reveals that in certain states of Eastern India, reliance on natural methods has remained exceptionally high. Further, it is not the rural residents, or uneducated women, or women from poorer households who rely on such methods, but urban educated women Basu (2005).[3] She points out that among the educated affluent sections of the population – particularly among residents of urban areas – cultural re-orientation may lead to a shift from reliance from modern to natural contraceptive methods. Given the socio-economic profile of this user group, natural methods are used with both skill and knowledge to control fertility effectively. Given the effectiveness with

[3] Kovavisarach and Saringcarnan (2010) observe a similar trend in Thailand.

which such methods are used by the urban elite, Basu coins the term 'ultramodern contraception' to refer to such practices.

Basu's work challenges conventional notions about the motivations guiding adoption of natural contraceptive methods and their supposed ineffectiveness in controlling fertility. This work focuses on an issue that is not an isolated regional phenomenon but may also be situated in a global context. WHO data reveal that 13 percent of currently married women aged 15-49 years in developed countries relies on natural methods, against 6 percent in developing countries.[4] Reliance on natural methods is particular common in Eastern and Southern Europe (25.7% and 19.5%). Use of natural contraceptive methods is also comparatively high in countries with a high proportion of Muslims (like Malayasia 24.6%, Kazakisthan 13.5%, Iran 16.9%, West Asian countries 18.1%) and Roman Catholics (like Phillipines 15.5%, Italy 21.4%, Spain 13.6%, Poland 30.4%, Peru 18.5%), where religious prohibitions discourage use of modern contraceptive methods. This would indicate that underlying cultural factors may have a major role in the adoption of such methods. The nature of the cultural environment, and how it motivates contraception choice, needs to be closely examined.

This paper, therefore, re-examines the concept of 'ultramodern contraception'. In particular, we compare alternative explanations of the prevalence of natural contraceptive methods in the eastern region of India - focussing on the state of West Bengal – and examine whether the reliance on natural methods of family planning is really a form of

[4] Available at http://www.un.org/esa/population/publications/contraceptive2005/WCU2005.htm, accessed on 3 December 2011.

cultural dissent or a modified manifestation of cultural forces customarily guiding fertility choices in such countries, and whether it is genuinely effective in controlling fertility. The choice of West Bengal is guided by the high usage of natural methods in the state. Further, both in terms of population and geographical area (total population is 91.3 million and female population is 44.4 million, according to the 2011 Census; its area is 34,267 sq. miles) West Bengal is larger than many European, Latin American and Asian countries.

The paper is structured as follows. In the next section we summarize the concept of 'ultramodern contraception' and the cultural explanation underlying this phenomenon offered by Basu (2005), following the discussion with an analysis of its shortcomings. We then describe the database, sample profile and method employed. Findings are stated and discussed in the next two sections. The fourth section presents the bivariate analysis, while the results of the multivariate analysis are discussed in the penultimate section. A concluding section sums up the main findings and identifies possible avenues for further research in this area.

2. Ultramodern contraception – A critical analysis

2.1 Ultramodern contraception

Based upon analysis of NFHS-1 data (1992-93), Basu (2005) argues that emerging forms of feminity, and its contradictions with Western ideologies, leads women to adopt non-invasive natural methods like *coitus interrupts*, rhythm and conventional contraception

methods (condoms).[5] While the overall contraceptive prevalence rate in India is 40.6 per cent, 5.8 per cent of currently married women aged 15-49 years in urban areas practise withdrawal and rhythm, while this figure increases to 11.6 per cent on adding condom users. In contrast, the figures for rural areas are 1.2 and 5 per cent, respectively. The ranges become more striking when one disaggregates women by education and age. Natural methods account for 62 of total contraceptive use among urban women aged 20-29 years and with a college degree, compared to 13 per cent among rural illiterate women. For women aged 30-34, the figures are 52 and 7 per cent.

As natural methods are practiced by 'elites' - who have both the skill and knowledge to use such methods reliably – Basu warns that use of natural or traditional methods should not be equated with traditional attitudes or ignorance. In fact, she argues, citing data from NFHS-1, traditional contraceptive use is associated with smaller family size, indicating the high level of efficiency in their use:

> "Looking in particular at women aged 30-34, who are in principle nearing the end of voluntary reproduction but are nevertheless fecund, for urban degree holders, the mean number of children ever born (CEB) is 1.9 for all women, 2.5 for sterilized women and 1.6 for users of rhythm and withdrawal. That is, the users of traditional methods end up with *lower* fertility than the average for their group as a whole *as well as* users of the more effective methods like sterilization. On the other hand, for rural illiterate women of similar age, the mean CEB is 3.8, that for

[5] Condoms are considered a 'traditional' form of contraception because: "condoms have existed and been in use for centuries, but also because they are non-invasive and because they are among the most 'inefficient' methods of pregnancy prevention in all the standard evaluatory models of family planning programmes" (Basu, 2005: 304-305). During our subsequent data analysis, however, we will restrict the meaning of traditional contraception to only withdrawal and rhythm.

sterilized women is 4.1 and that for users of traditional methods is *higher* than both at 4.2. Efficiency of method therefore is very much a function of the nature of the user" (Basu, 2005: 308).

Moreover, use of traditional contraceptives is motivated by modern attitudes, especially about feminity, the female body and reproductive processes. Practice of such forms of birth control is therefore a mark of modern society. It is a manifestation of cultural elitism - in economic terms, 'snob effect' (Leibenstein, 1950).

Basu (2005) explains the increasing adoption of traditional contraceptive methods among the urban elite in terms of a reaction against the 'misplaced modernity' spreading among poorer women. Such women view the body as a functional unit, which has to be used to perform basic socio-cultural and economic tasks subject to interference from menstruation and pregnancies. So, once the desired family size is attained, the two processes become burdensome and something which women wish could be done away with. This attitude encourages interest in modern contraceptive methods that can be easily used – particularly if one of the side effects is to reduce intensity of the menstrual cycle. The intrusion of the state into the daily private life of women becomes a welcome process as the medicalization of the body occurs through public provisioning of reproductive health related services providing relief from pregnancy and menstruation.

The demand for ultramodern contraceptives emerges as a reaction to such misplaced modernism, through the emergence of post modern attitudes among the urban educated women. Instead of viewing the body as a functional producer unit, it is increasingly being

viewed as temple that must be nurtured and protected. The growing 'body consciousness' (Uberoi, 2001) among the urban elite, manifested by the conceptualization of the body as a consumer unit thereby shifting focus from ritual purity of the body to personal hygiene (Puri, 1999), creates a reaction against scientific and technology-based modern means and towards natural eco-friendly products. In the case of reproductive behavior, this encourages urban educated 'ultra modern' women to shun modern contraception methods associated with Western science and technology and leads to the adoption of family control methods that are less invasive, more in tune with emerging forms of feminity – as well as having links with tradition and the past.

2.2 Some questions

While this line of argument is original and persuasive, it has some limitations.

Firstly, an in depth analysis of factors responsible for the choice of traditional methods is required before arriving to a conclusion about the reasons underlying contraceptive choice. Basu's arguments are based on the emerging anthropological and psychological literature on women's attitude towards the body. Unfortunately, in the absence of empirical analysis of the motives underlying contraceptive choice, this explanation remains essentially speculative.

Secondly, changes in fertility behaviour are a complex process (Roy et al., 1999). Despite the advent of modernity and Western attitudes in Indian society, traditional forces may still remain a force to be reckoned with. There are several works that seek to identify the

socio-economic determinants of contraceptive choice (Arnold, 2001; Bulatao, 1989; Dutta and Husain, 2011; Jayaraman et al., 2009). Such studies reveal the presence of a strong son preference guiding contraceptive choice and fertility preferences (Arnold, 2001; Jayaraman et al., 2009). It is quite possible that the popularity of traditional contraceptives is a manifestation of son preference and not the so-called 'modern preferences'. This is important given that it is among the urban elite that son preference and sex selection is dominant (Jha et al, 2011; Nanda and Veron, 2005).

Thirdly, contraceptive choice is conceptualized in static terms, ignoring the possibility of shifts in preferences over different phases of the reproductive life cycle. In particular, Basu (2005) does not consider the possibility that women may adopt modern methods during their peak reproductive years, after which they may switch to periodic abstinence – a tendency observed among educated Bangladeshi women having one son (Kamal et al., 2007). Similarly, women with unsatisfied fertility may rely on traditional contraceptive methods; subsequently, after attaining the desired parity and gender composition, they shift to modern forms of birth control. It may be observed on analyzing NFHS-3 data, that traditional contraceptive users comprises a large section among currently married urban elite women[6] of West Bengal wanting a child within 2 years (29.0%), wanting a child but unsure about timing (42.9%) and undecided (31.8%). Corresponding figures for users of modern method are 18.3%, 14.3% and 40.9%. In contrast, about half of women wanting a child after two years use modern contraceptive methods (50.8%), while 35.2 percent use traditional methods. In other words, a high level

[6] Urban elite is defined as urban women with above secondary levels of education and belonging to highest Standard of Living group.

of unsatisfied demand for children exists among users of traditional contraceptive method, which may be a possible explanation of the lower number of children ever born *till date* within this group observed by Basu (2005).

Fifthly, Basu's conclusions about the effectiveness of 'ultramodern' methods are based on an analysis of number of living children, rather than on actual number of pregnancies. Her study does not consider the possibility that lack of knowledge and skill may lead to high levels of use of emergency contraception and induced abortions, while unprotected sex may cause RTI/STI. Use of any variant of the rhythm method requires a degree of knowledge of the physiological process of conception and the stages of the ovulatory/menstrual cycle, as well as considerable level of inter-spousal communication. NFHS-3 data reveals that 60.4 percent of urban elite using traditional contraception do not have knowledge of the ovulatory cycle, while the corresponding figure for users of modern methods is 72.6 percent. Lack of knowledge and skill may lead to unintended pregnancies (Gray et al., 1997). In such cases, the couple may have to rely on emergency contraception or go for induced abortion – both of which are detrimental for reproductive health, fecundity and mental health of the women.[7] Based on Phillipine data, Juarez (2009: 3-4) notes:

> "Compared with women using modern methods of contraception, women using traditional methods account for a disproportionately large share of women seeking an abortion (Shire, 2003). In 2003–2004, 35% of all women who reported seeking an abortion had been using traditional methods at the time they conceived,

[7] In addition, if the woman has more than one sexual partner, using traditional methods may increase the probability of RTI/STI and HIV/AIDS.

compared with 21% of all married women who did not want another child soon or ever."

Similarly, NFHS-3 data reveals that within the group of currently married urban elite (as defined earlier) in West Bengal 18.2 percent of traditional contraceptive users have had terminated pregnancies, compared to 15.9 percent among users of modern method and 17.9 percent in the group as a whole. In India, as a whole, corresponding figures are 25.1, 20.7 and 20.5 percent, respectively. In fact, the incidence of medically terminated pregnancies among users of traditional method is even higher than among non-users (18.8%), and marginally lower than among users of folkloric methods (26.5%). A high incidence of induced abortions was also observed during a primary study of West Bengal women (Mukherjee, 2009). This not only raises questions about the efficiency of ultramodern contraception, but implies that use of such methods may have adverse health consequences - as seen in Japan (Sato and Iwasawa, 2006) and Nigeria (Otoide et al., 2001).[8]

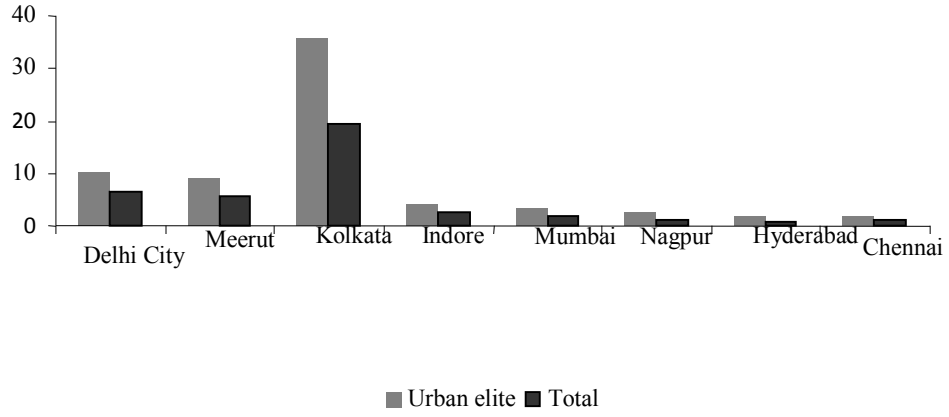
Couples can err on the other extreme also. Instead of restricting sexual activity to 'safe' periods, for instance, couples may abstain over much longer periods than necessary. For instance, a study in Bangladesh (Kamal et al., 2007) reported that women were using the periodic abstinence method incorrectly, abstaining for more days than is necessary.

Finally, inter-state variations in use of traditional contraceptives are not explained. Basu (2005) does not explain why traditional contraceptives are popular among the elite of

[8] In Nigeria, unwanted pregnancy leads to induced abortion. Since this is illegal, induced abortion has to be done secretly and is unsafe. Consequently, abortion leads to about 40% of maternal deaths in Nigeria (Otoide et al., 2001).

Kerala (10.9%) and West Bengal (25.3%), but low among elites of other states. Analysis of NFHS-3 data reveals that reliance on traditional contraception is substantially higher in Kolkata compared to other metropolitan cities like Chennai, Delhi and Mumbai – even though the latter cities are much more modernized (Fig. 1).

Fig. 1: Reliance on traditional contraception in selected metropolitan cities of India - 2005-06



In particular, if we consider the use of contraceptive methods amongst different linguistic groups one finds that users of traditional family planning methods (within urban elite women) comprise 33.7 percent of Bengalis,[9] 33.0 percent of Manipuris, and 28.5 percent of Assamese. The popularity of traditional methods within the Bengali community may be observed, not only in West Bengal (38.3%), but also in neighbouring states like Assam

[9] Bengalis, forming 7.4 percent of the surveyed women, constitute the second largest linguistic group within the NFHS sample, after Hindi-speaking sample (39.2%).

(32.5%), Jharkhand (30.4%), and Tripura (26.8%), where Bengalis constitute a sizeable section of the population of the state (Table 1).

Table 1: Contraceptive use across linguistic groups and states in India – 2005-06

State	Language	No method	Folkloric method	Traditional method	Modern method
Other states	Other languages	33.4	0.2	7.9	58.5
	Bengali	37.2	0.9	18.8	43.2
	Total	33.5	0.2	8.0	58.3
West Bengal	Other languages	23.5	-	22.0	54.6
	Bengali	22.7	-	38.3	38.9
	Total	22.9	-	34.2	42.9
Assam	Other languages	30.8	-	29.2	40.0
	Bengali	31.9	0.7	32.6	34.8
	Total	31.2	0.2	30.4	38.2
Tripura	Other languages	28.6	-	14.3	57.1
	Bengali	31.5	-	26.8	41.7
	Total	31.3	-	26.1	42.5

2.3 Research questions

The above analysis caste aspersion on the explanation offered for the high traditional contraceptive prevalence and the conceptualization of the issue of ultramodern contraception. In this paper, therefore, we re-examine the issue of high prevalence of traditional contraceptive methods. This paper accepts Basu's proposition that ultramodern methods are mainly used by urban educated and well off families, but argues that use of traditional birth control methods may not be a reflection of elitism or modern attitudes. Rather it may be linked to the desire to attain target family size and gender composition of children (son preference). The paper also departs from Basu (2005) by focussing on West Bengal, and not on India as a whole. The focus on this state may be justified in view of the high prevalence of traditional contraception methods in Eastern states noted

in Section 2.2. Among these states, West Bengal is the largest state, with a geographical area of 88752 square kilometer and a population of 91.3 million (comprising 7.5% of India's population in 2011). The population of West Bengal is 3 times that of Assam, 25 times that of Tripura and 34 times that of Manipur.

3. Database and method

The study is based on three rounds of the National Family Health Survey undertaken in India. These surveys are conducted under the stewardship of the Ministry of Health and Family Welfare, Government of India, with the International Institute for Population Sciences, Mumbai, serving as the nodal agency. Information is collected through a household survey which provides estimates of indicators of population, health, and nutrition by background characteristics at the national and state levels. Information was collected based on individual interviews. NFHS forms part of the internationally known Demographic Health Survey (DHS) series. Three rounds of the survey have been conducted so far – in 1992-93, 1998-99 and 2005-06. The Individual files (files containing information about women aged 15-49 years) are extracted from the three rounds and merged to form a single dataset. Since the datasets do not match perfectly, in terms of both coding and parameters on which information are provided, merging leads to loss of information. But such loss is offset by the fact that we have information on reproductive behaviour over a period of time, spanning more than a decade (from 1992-93 to 2005-06), when economic restructuring of the economy and integration with the global economy was leading to corresponding changes in the social structure.

After merging, currently married women who are not currently pregnant were selected; the remaining respondents were dropped. This results in a sample size of 237822, of which 12279 are from West Bengal.[10] The sample characteristics of the final sample are briefly reported in Table 2.

It may be seen that about 35 percent (40 percent in West Bengal) of the all-India sample reside in urban area. Keeping pace with rapid urbanization, the share of urban population has increased over the three rounds for both the total and Bengal samples. In India, socio-religious identity of respondents has been observed to be a major influence on socio-economic status and behavioural patterns. Hindu Forward Castes (HFCs), consisting of Upper Castes and Other Backward Castes, compose the largest socio-religious group – representing over half of the total sample. Hindu-Scheduled Castes (HSC) and Hindu Scheduled Tribes (HSTs) are other groups within Hindus, the major religious group in west Bengal. While the share of HSTs in the sample is quite low, HSCs consists of a larger proportion of the sample, particularly in West Bengal. Muslims comprises the largest religious minority groups, with their share being almost one fourth in West Bengal.

[10] The all-India round-wise sample size is 77338, 78364 and 82120 for NFHS-1, NFHS-2 and NFHS-3, respectively. Corresponding figures for West Bengal are 3658, 3889 and 4732.

Table 2: Profile of sample respondents

Socio-economic correlates		India				West Bengal			
		1992-93 (NFHS-1)	1998-99 (NFHS-2)	2005-06 (NFHS-3)	Total	1992-93 (NFHS-1)	1998-99 (NFHS-2)	2005-06 (NFHS-3)	Total
Type of place of residence	Urban	31.2	31.4	44.0	35.7	21.5	44.7	50.1	39.9
	Rural	68.8	68.6	56.0	64.3	78.5	55.3	49.9	60.1
Socio-religious identity[1]	H-SC	10.6	15.2	14.7	13.5	9.1	21.0	22.1	17.9
	H-ST	7.2	7.1	5.9	6.7	4.1	3.7	3.2	3.6
	H-Others	61.0	56.0	54.1	57.0	58.5	54.6	48.8	53.5
	Muslim	10.2	11.7	12.8	11.6	26.3	18.5	24.6	23.2
	Others	11.0	10.0	12.6	11.2	2.0	2.2	1.4	1.8
Grouped age of respondents	13-19 years	8.3	7.0	4.6	6.6	11.3	6.3	6.6	7.9
	20-29 years	37.9	36.8	34.4	36.3	40.0	37.0	34.4	36.9
	30-39 years	32.8	34.4	36.7	34.7	30.3	34.6	34.7	33.3
	40-50 years	21.0	21.8	24.3	22.4	18.3	22.1	24.3	21.8
Highest education of respondent[2]	No education	56.3	49.4	38.9	48.0	52.4	37.2	35.2	41.0
	Primary	14.6	16.9	15.5	15.7	20.4	23.5	19.8	21.1
	Secondary	21.0	24.2	36.7	27.5	21.1	28.4	36.3	29.3
	Higher	8.1	9.5	8.9	8.8	6.0	10.9	8.7	8.6
Occupation of respondent[3]	Unemployed	67.8	65.4	59.6	64.2	78.8	79.2	69.6	75.4
	Primary	19.8	29.3	30.2	26.5	9.7	16.6	19.0	15.5
	Tertiary	12.3	5.2	10.3	9.3	11.5	4.2	11.4	9.1
Highest education of partner	No education	31.0	25.3	22.4	26.2	34.9	23.3	26.3	27.9
	Primary	17.4	18.3	15.3	17.0	21.8	24.1	18.8	21.4
	Secondary	33.7	36.8	47.6	39.6	29.3	32.6	40.0	34.5

Socio-economic correlates		India				West Bengal			
		1992-93 (NFHS-1)	1998-99 (NFHS-2)	2005-06 (NFHS-3)	Total	1992-93 (NFHS-1)	1998-99 (NFHS-2)	2005-06 (NFHS-3)	Total
	Higher	17.9	19.5	14.7	17.3	14.0	20.0	14.8	16.2
Occupation of partner	Unemployed	3.8	4.1	2.3	3.4	2.8	6.1	2.1	3.6
	Primary	36.7	66.5	61.4	55.0	46.0	58.9	58.9	55.0
	Tertiary	59.5	29.4	36.3	41.6	51.3	35.0	39.1	41.4
Grouped Standard of Living Index[4]	Poorest	24.4	22.0	25.5	23.8	27.2	24.9	20.6	24.5
	Poor	18.0	20.1	21.1	19.6	18.8	17.7	23.2	19.5
	Middle	19.2	20.0	15.1	18.3	20.5	19.3	22.4	20.5
	Rich	18.1	18.6	20.4	18.9	17.9	22.0	24.1	21.2
	Richest	20.2	19.4	17.9	19.3	15.5	16.1	9.7	14.2

Note:

1. Socio-religious identity is formed by combining information on religion and caste of respondents. The following groups are formed: Hindu-Scheduled Castes (HSC), Hindu-Scheduled Tribes (HST), Hindu-Others, comprising of Forward Castes and Other Backward Castes (H-Others).

2. Respondents are clubbed by educational levels into four groups: no education (illiterate, below primary), completed primary, completed secondary and higher (including those completing higher secondary levels, graduates, post graduates, etc.).

3. Information on occupation of both partner and respondent was recoded to form three classes: Unemployed (including unemployed, household and domestic work, don't know), Primary (agricultural self-employed, agricultural employed, skilled and unskilled) and Tertiary (Professionals, Technical, Managerial, Sales, Services).

4. Standard of Living Index was calculated for each of the three rounds following the method suggested in Roy et al. (1999). The SLI scores were used to divide the samples in each round into quintile groups.

Table 3: Percentage of curre

Most of the women belong to the 20-29 and 30-39 year age groups, while the share of women aged below 20 years is quite low. The proportion of illiterate women is highest, followed by those with secondary level education. Over time, the share of illiterates in sample has fallen, while the share of secondary-educated women has increased. A similar pattern is observed with respect to education of respondent partner. While the majority of women are not engaged in economic activities, this share has decreased between the last two rounds. Feminization of agriculture has led to increase in share of women in the primary sector. In comparison partners were concentrated in primary sector in the first round, but have shifted to the tertiary sector in subsequent sectors. The distribution of respondents by standard of living index groups is more or less even across groups, with the 'poorest' group having the highest frequency.

The analysis starts with a bivariate analysis of traditional contraceptive prevalence rates among women of different socio-economic stratum (classified by parity, age, religion, caste, education, employment status, profile of partner, etc.) to identify the socio-economic groups commonly using traditional methods. Parametric and non-parametric tests are undertaken to test the hypotheses that users of traditional contraceptives are more efficient in keeping fertility low. We then explore the relationship between contraceptive use and gender-parity, along the lines suggested by Jayaraman et al. (2009). This is followed by estimation of a multinomial logit model regressing contraceptive choice on parity and gender composition of living children, taking socio-economic and demographic profile as the control variables.

4. Analysis

Our estimates reveal that 6.8 percent of currently married women aged 15-49 years use traditional methods of family planning. Round-wise estimates indicate that usage of such methods has increased over the three rounds - 4.0% (1992-93), 6.3% (1998-99) and 8.6% (2005-06). Bi-variate analysis (Table 3) reveal that usage of such methods is relatively higher among urban women, educated women (with secondary or higher levels of education), those employed in the tertiary sector, women aged 20-39 years, women with partners educated beyond secondary levels or engaged in tertiary sector jobs, women from affluent households (belonging to the top two quintiles of standard of living) and Muslims.

Table 3: Percentage of currently married women using traditional methods among socio-economic groups in India

Socio-economic correlates		**1992-93**	**1998-99**	**2005-06**
Place of residence	Urban	4.8	8.7	9.4
	Rural	3.5	5.2	8.1
Highest education of respondent	No education	2.1	3.9	6.2
	Primary	3.8	5.5	7.3
	Secondary	6.1	8.7	10.5
	Higher	7.6	13.9	14.0
Occupation of respondent	Unemployed	4.6	7.2	9.3
	Primary	2.0	3.4	6.5
	Tertiary	4.1	11.1	10.8
Grouped age of respondents	13-19 years	15.7	3.8	7.2
	20-29 years	5.1	6.2	9.0
	30-39 years	3.6	7.4	9.7
	40-50 years	2.6	5.6	6.8
Highest education of partner	No education	2.1	3.6	5.9
	Primary	2.8	4.8	6.7
	Secondary	4.7	6.6	9.2
	Higher	6.0	10.7	13.0

Socio-economic correlates		1992-93	1998-99	2005-06
Occupation of partner	Unemployed	3.4	6.2	7.6
	Primary	3.0	5.1	7.6
	Tertiary	4.6	9.0	10.4
Grouped age of partners	10-25 years	8.2	4.1	7.5
	26-30 years	5.4	5.8	8.7
	31-40 years	3.9	7.2	9.3
	41-50 years	3.5	6.9	9.0
	50 & above	2.5	4.7	6.0
Grouped SLI	Poorest	2.5	4.0	5.7
	Poor	3.0	4.7	7.5
	Rich	4.3	7.7	9.4
	Richest	5.6	9.9	10.4
Socio-religious identity	H-SC	2.8	5.0	8.2
	H-ST	2.2	3.5	4.8
	Muslim	5.6	6.7	9.4
	Others	4.6	7.9	8.9

Figures for the urban educated and affluent class – Basu's elite – also reveal that one out of every ten currently married women relies on traditional family planning methods (10.4%). The *overall trend over the period of study*, however, cannot be said to be increasing, as the rate of increase has remained same after NFHS-2 – 6.7% (1992-93), 11.9% (1998-99) and 11.2% (2005-06). Moreover, it should be noted that these figures are high only in a *relative* sense. In no case, is the percentage greater than 16%. Out of the 96 cells of Table 3, in only 9 cases is the value greater than 10%, while in 35 cases it is less than 5%.

4.1 Ultramodern contraception in West Bengal

Basu (2005) considers these figures high enough to arrive at strong conclusions about changes in reproductive behaviour linked to cultural dissent and reaction against Western

influences within a society that is otherwise more than keen to adopt Western practices. If one looks at state-wise figures, however, the above figures are quite low compared to figures for West Bengal, Assam, Tripura and Manipur (see Table 4).[11] In particular, figures for West Bengal, a state with 44.4 million women, comprising 7.6% percent of the female population of the country are worth noting.

Table 4: State-wise variations in traditional contraceptive prevalence rate among currently married women

State	2005-06	1998-99	1992-93
Andhra Pradesh	0.7	0.5	0.6
Assam	28.8	17.0	49.2
Bihar	5.8	1.6	5.8
Jharkhand[1]	4.9	NA	NA
Gujarat	10.0	5.6	4.9
Haryana	4.8	8.8	11.3
Himachal Pradesh	1.8	7.5	7.7
Jammu and Kashmir	7.9	6.9	20.0
Karnataka	1.0	1.7	3.4
Kerala	10.7	7.7	14.0
Madhya Pradesh	3.0	1.3	2.1
Chhattisgarh[2]	3.0	NA	NA
Maharashtra	2.0	1.6	2.1
Manipur	25.6	12.6	30.9
Orissa	5.6	5.8	3.4
Punjab	7.1	12.8	12.4
Rajasthan	2.4	2.0	2.5
Tamil Nadu	1.5	2.3	8.1
Tripura	20.9	11.4	48.3
Uttar Pradesh	12.7	5.4	6.0
Uttaranchal[3]	3.9	NA	NA
West Bengal	23.3	21.5	35.2

[11] The sharp drop in 1998-99 is a peculiarity for reproductive information in NFHS-2.

State	2005-06	1998-99	1992-93
All India	8.1	5.8	11.6

Note: Chattisgarh, Jharkhand and Uttarakhand were merged with Madhya Pradesh, Bihar and Uttar Pradesh, respectively.

The extent of reliance on traditional contraceptive methods in West Bengal among all socio-economic groups is worth noting. In particular, it is high among urban residents, respondents with more than 10 years of schooling, respondents engaged in tertiary sector, women aged below 40 years, with partners aged 26-50 years, working in the tertiary sector or with more than 10 years of schooling, respondents belonging to top two quintile groups and belonging to Hindu-Other[12] and Other[13] communities. Table 5 also reveals that urban women with more than 10 years of schooling and belonging to the top two quintile group demonstrate greater reliance on traditional birth control methods. It is not that the pattern of variation differs between West Bengal and India as a whole – what we observe is a marked accentuation of patterns observed for the India sample in West Bengal. Figures are 'blown up' - doubling, trebling and increasing by five or ten times, compared to figures for all India.[14]

Table 5: Percentage of currently married women using traditional methods among socio-economic groups in West Bengal, India

Socio-economic groups		West Bengal			Elite in West Bengal		
		1992-93	1998-99	2005-06	1992-93	1998-99	2005-06
Type of place of residence	Urban	20.2	30.0	28.8			
	Rural	13.1	17.0	20.1			
Highest education of	No education	8.0	12.3	16.4			
	Primary	16.1	19.7	19.7			

[12] Hindu-Other consists of Hindu respondents belonging to the upper caste and other backward caste groups, and does not include Scheduled Castes and Tribes.
[13] Others comprises of non-Muslim religious minorities, like Christians, Sikhs, Parsis, etc..
[14] Figures increase by more than 5 times in 45 cases, and by more than 10 times in 10 instances.

Socio-economic groups		West Bengal			Elite in West Bengal		
		1992-93	1998-99	2005-06	1992-93	1998-99	2005-06
respondent	Secondary	22.0	30.8	31.1			
	Higher	30.5	44.4	40.2			
Occupation of respondent	Unemployed	16.6	24.5	26.4	34.0	45.9	37.5
	Primary	4.8	14.0	17.2	-	100.0	50.0
	Tertiary	9.7	25.2	24.7	26.3	43.6	42.2
Highest education of partner	No education	9.0	11.8	16.6	-	25.0	-
	Primary	9.6	18.0	18.4	-	-	-
	Secondary	16.5	24.2	28.5	37.5	37.8	47.5
	Higher	28.1	39.1	35.0	32.7	46.8	38.0
Grouped age of respondents	13-19 years	37.8	28.9	25.6	-	20.0	-
	20-29 years	18.3	23.3	24.8	35.0	34.7	26.0
	30-39 years	10.6	23.3	26.9	34.0	51.6	47.0
	40-50 years	8.5	19.5	20.1	28.6	48.3	37.6
Occupation of partner	Unemployed	10.9	24.1	18.4	-	34.3	100.0
	Primary	13.2	19.1	21.0	-	51.4	50.0
	Tertiary	16.1	28.8	30.0	33.1	46.4	37.8
Grouped age of partners	10-25 years	30.7	23.9	24.0	-	-	-
	26-30 years	20.7	25.6	24.4	27.3	35.7	30.0
	31-40 years	14.9	23.2	25.6	38.6	44.3	38.8
	41-50 years	11.0	23.2	25.7	32.0	50.0	49.0
	50 & above	7.4	16.9	19.3	23.1	49.2	23.3
Grouped SLI	Poorest	10.0	13.9	13.6			
	Poor	10.4	17.4	23.1			

Socio-economic groups		West Bengal			Elite in West Bengal		
		1992-93	1998-99	2005-06	1992-93	1998-99	2005-06
	Middle	11.1	20.9	24.7			
	Rich	20.7	29.7	33.7			
	Richest	23.7	35.9	32.8			
Socio-religious identity	H-SC	8.2	15.7	20.8	-	36.4	42.1
	H-ST	6.3	9.7	17.3	33.1	46.3	40.2
	H-Others	15.9	27.9	28.0	-	37.5	25.0
	Muslim	14.7	19.3	21.3	-	40.0	23.1
	Others	20.0	15.5	28.8	-	36.4	42.1

A comparison of Tables 3 and 5 clearly reveals the stark contrast in levels of traditional contraception use between West Bengal and India. In particular, in line with Basu's findings, we find that educated women belonging to affluent households and residing in urban areas rely to a substantial extent on traditional methods of family planning. Basu had further argued that, given the socio-economic characteristics of such users, traditional methods will be quite effective. Let us now turn to an examination of this proposition.

4.2 Efficiency of Ultramodern contraception

The 'efficiency' of ultramodern contraception is tested on the basis of four fertility related variables:

a) Number of children ever born,

b) Number of living sons,

c) Number of living girls, and

d) Number of living children.

Differences in these variables - and whether these differences are statistically significant - across users of modern and traditional contraception methods are examined in Table 6. Basu (2005) had examined differences in fertility between users of traditional and modern methods using mean. If we compare mean values and testing for differences using the t-ratio, traditional contraception users appear to be more efficient in keeping fertility low. However, a problem with mean is that it may be influenced by extreme values. This problem may be avoided by comparing median, and using Kruskall-Wallis H-test (which also avoids the assumption of normal distribution). Table 6 shows that number of children ever borne, number of living children and number of livings sons is greater among users of modern methods, but difference in number of living girls is not statistically significant even at 5% level. Further, on examining statistical differences in these variables in each round,[15] or between respondents grouped by marital duration,[16] we found a similar pattern.

Table 6: Differences in fertility-related variables between users of modern and traditional contraception among urban elite of West Bengal, India – Merged data

Fertility indicator	Mean			Median		
	Traditional method	Modern method	t-ratio	Traditional method	Modern method	Kruskall-Wallis H-ratio
Total children ever born	2.69	3.40	41.85**	2	3	76.62**
No of living children	2.48	3.09	39.94**	2	3	58.58**
No of living sons	1.25	1.68	44.17**	1	2	52.83**
No of living girls	1.23	1.41	16.11**	1	1	2.87

Note: ** denotes significance at 1% level.

[15] For NFHS-1 differences in only children ever borne was found to be significant – differences in other variables were insignificant even at 10% level.

[16] Respondents were classified by marital duration into three groups – 0-5 years, 6-10 years and rest. The t-ratio indicated significantly higher fertility levels (except for number of living girls) among women using modern methods for all groups. With respect to number of living girls, difference in fertility levels was significant only for the last group (married for more than 11 years). Similar findings were observed for the Kruskall-Wallis H-tests, with one difference. For women married less than 6 years, no statistically significant differences in fertility levels were found for any of the indicators.

Now, as pointed out earlier, these differences – or their absence – do not necessarily reflect differences in efficiency of contraceptive methods. Nor, for that matter, do they indicate causation (use of natural methods leads to lower fertility levels). In particular, we should consider the possibility that use of traditional contraception is a temporary phase in the reproductive cycle of women, occurring when they have not attained their ideal family size and composition. This implies that women who have not attained desired family size and composition and are not overly concerned with getting pregnant will use traditional contraceptives to avoid side effects of modern methods; once they attain the optimal family size and composition, they will shift to modern methods, which are more reliable. This hypothesis may be checked by comparing differences in age, gap between actual and ideal children and gender parity between users of traditional and contraceptive methods.

Mean ages of users of traditional and modern contraception methods are 34 and 33 years, respectively. Although the age difference is statistically significant (t=2.5, p=0.1), the age gap does not indicate that the users are in two distinct phases of reproductive cycle.[17] We also find that 21 percent of women using traditional methods want an additional child; this is higher than proportion of women using modern methods and wanting an additional child (17 per cent).[18] Probing further, we find that the gap in actual number of sons (daughters) and ideal number of sons (daughters) is positive and statistically significant for both user groups.[19] Thus, both groups of women are exceeding their targeted family size, which does not speak well of the efficiency with which either of the contraception methods are used. However, while the gap between actual and ideal sons is greater for users of modern methods

[17] If individual Rounds are considered, age of users are as follows: Round 1: Traditional: 32, Modern 32, t=0.65; Round 2: Traditional: 34, Modern 33, t=1.23; Round 3: Traditional: 35, Modern 33, t=2.94.
[18] These percentages are 29.9 and 15.4 (Round 1), 18.9 and 15.1 (Round 2) and 21 and 20.7 (Round 3).
[19] Among users of traditional method, gap in actual number of sons (girls) and ideal number of sons (girls) is 0.26 (0.09), with t-value of 7.748 (2.714). For users of modern methods, the corresponding numbers are: 0.22 (0.25) and 5.641 (7.622).

(1.6; t=3.53), in case of girls, the difference is negligible (0.05; t=0.90). This implies, despite faulty targeting by both groups, users of traditional methods are *relatively better in targeting sons, but not daughters*. This is an odd result and requires close examination of the fertility preference of users.

The concept of gender parity (Jayaraman et al., 2009) is important in this context. This looks at parity – but also considering the gender composition of living children. Based on number of living sons and daughters, we club families by gender parity as follows:

Gender parity = (x, y), when x: No. of living children; y: No. of living sons.

Table 7: Gender parity and contraceptive choice among urban elite of West Bengal, over each NFHS Round

Parity	1992-93		1998-99		2005-06	
	Traditional	**Modern**	**Traditional**	**Modern**	**Traditional**	**Modern**
No child	32.6	46.9	25.0	15.2	26.0	29.9
(1, 0)	-	-	56.3	24.7	48.6	34.1
(1, 1)	-	-	46.9	35.4	43.4	42.1
(2, 0)	-	100.0	44.1	33.8	43.8	37.5
(2, 1)	22.2	22.2	35.2	45.1	30.0	49.2
(2, 2)	**-**	**100.0**	**29.7**	**56.8**	**35.8**	**49.1**
(3, 0)	-	-	45.5	45.5	-	83.3
(3, 1)	20.0	40.0	31.4	48.6	25.0	65.0
(3, 2)	**-**	**66.7**	**15.6**	**78.1**	**15.4**	**76.9**
(3, 3)	**-**	**-**	**42.9**	**57.1**	**-**	**100.0**
(4+, 0)	-	100.0	-	-	100.0	
(4+, 1)	-	75.0	33.3	53.3	-	50.0
(4+, 2)	**-**	**100.0**	**17.6**	**76.5**	**25.0**	**50.0**
(4+, 3)	**25.0**	**25.0**	**-**	**71.4**	**-**	**66.7**
(4+, 4)	**-**	**-**	**-**	**100.0**	**33.3**	**66.7**

Given the low fertility rates in West Bengal (median number of sons and daughters has been one each in each of the three rounds), the preferred gender parity seems to be (2, 1). The figures in bold in Table 7 shows parity levels once son preference is satisfied. Since sample

size is small in Round 1 (34, compared to 872 and 632 in Rounds 2 and 3, respectively), we ignore this Round. It is interesting to see that women who have attained this targeted gender parity tend to rely on modern methods less than on traditional methods. Here the causation leads from gender composition of children to choice of birth control methods. The direction of causation makes more sense, as it reverses the implied direction of causality implied in Table 6. This indicates that reliance on traditional contraceptive method may be a temporary phase in the reproductive phase of women.

Finally, we should also check the incidence of induced abortions to rule out the fact that inefficiency in use of rhythm and withdrawal is compensated by medical termination of unwanted pregnancies. This is important given that NFHS-3 data shows that only 23.1 percent of urban elite women using traditional methods of contraception are aware of when the ovulatory cycle occurs. A higher proportion of users of modern methods have had abortions in Round 1 (though the difference is insignificant) and Round 2, but this gets reversed in Round 3.[20] Nevertheless, as seen earlier, the *number* of induced abortions per women in 2005-06 is higher among users of traditional family planning methods. Unfortunately, this variable is not available in earlier rounds.

To sum up, the analysis undertaken in this section raises questions challenging Basu's (2005) claim that ultramodern contraception methods are more efficient than modern methods. In particular, the relationship between contraceptive choice and gender parity indicates that reliance on traditional contraceptives may be a temporary phase occurring before attainment of desired family size and gender composition (when consequence of failure is not concerning), while the relationship between contraceptive choice and induced abortions

[20] Proportion of women by contraception method having had abortions are as follows: Round 1: Traditional method 17%, Modern Method 20%, t = -0.60; Round 2: Traditional method 19% , Modern Method 29%, t = -2.85; Round 3: Traditional method 20%, Modern Method 14%, t = 1.94.

castes doubts on supposed efficiency of ultramodern methods. Now the analysis of gender parity and gender parity was undertaken without controlling for socio-economic characteristics of respondents. Given the importance of this result for our analysis, we undertake an econometric analysis to test the hypothesis that women shift from traditional family planning methods to more reliable modern methods once targeted gender parity is attained.

4.2 Multivariate analysis

Six regression models are estimated. Model 1 is the basic model, identifying determinants of contraceptive choice at the all-India level. Model 2 is estimated by adding a dummy for West Bengal residents, to test whether reliance on traditional contraceptive methods is indeed greater in West Bengal. Model 3 is Model 1, re-estimated for West Bengal respondents only to confirm that determinants of contraceptive method are not different for this state. In the next step, a dummy for urban elite is added to test whether reproductive choice of this group varies significantly from the remaining respondents. Models 4 and 5 are run for West Bengal, using two definitions of 'urban elite'. In Model 4, 'urban elite' refers to urban residents with secondary or higher levels of education – so that definition of 'urban elite' corresponds to Basu (2005). In Model 5, the SLI criterion is added – in addition to residing in urban areas and having at least secondary level of education, respondents belong to the top two standard of living groups.

In all, we have estimated five multinomial logit models. The models estimated are:

$$RV313 = \alpha + \beta_1\ URBAN + \beta_2\ V012 + \beta_3\ SV012 + \beta_4\ PRIMARY + \beta_5\ SECONDARY + \beta_6\ HIGHER + \beta_7\ P\_PRIMARY + \beta_8\ P\_SECONDARY + \beta_9\ HSC + \beta_{10}\ HST + \beta_{11}\ MUSLIM + \beta_{12}\ OTHERS + \beta_{13}\ LCHILD + \beta_{14}\ SLIGROUP1 + \beta_{15}\ SLIGROUP2 + \beta_{16}\ SLIGROUP4 + \beta_{17}\ SLIGROUP5 + \beta_{18}\ NFHS2 + \beta_{19}\ NFHS3 + u_i \quad \text{estimated for all-India} \qquad [1]$$

$RV313 = MODEL\ 1 + \beta_{20}\ BENGAL + u_i$ estimated for all-India [2]

$RV313 = MODEL\ 1$ estimated for West Bengal sample [3]

$RV313 = \alpha + \beta 1\ V012 + \beta 3\ SV012 + \beta 7\ P\_PRIMARY + \beta 8\ P\_SECONDARY + \beta 9\ HSC + \beta 10\ HST + \beta 11\ MUSLIM + \beta 12\ OTHERS + \beta 13\ LCHILD + \beta 14\ NFHS2 + \beta 19\ NFHS3 + + \beta 20\ WBELITE + u_i$

estimated for urban elite in West Bengal [4]

$RV313 = \alpha + \beta 1\ V012 + \beta 3\ SV012 + \beta 7\ P\_PRIMARY + \beta 8\ P\_SECONDARY + \beta 9\ HSC + \beta 10\ HST + \beta 11\ MUSLIM + \beta 12\ OTHERS + \beta 13\ LCHILD + \beta 14\ NFHS2 + \beta 19\ NFHS3 + + \beta 20\ WBELITE' + u_i$

estimated for urban elite in West Bengal [5]

when

RV313: Choice of contraceptive method (1: Not using contraceptive methods and using folkloric method; 2: Using traditional contraceptive method; 3 Using modern contraceptive method; with base outcome being using traditional contraceptive method)

URBAN: Respondent residing in urban area

BENGAL: Dummy for respondents residing in West Bengal

V012: Age of respondent (Continious variable)

SV012: Square of age of respondent (Continious variable)

V512: Marital duration (Continious variable)

PRIMARY: Respondent has primary education

SECONDARY: Respondent has primary education

HIGHER: Respondent has primary education

(Reference category: Respondent is illiterate)[21]

HSC: Respondent is Hindu-Scheduled Caste

HST: Respondent is Hindu-Scheduled Tribe

MUSLIM: Respondent is Muslim

[21] Education of only respondent, and not partner, is taken as correlation between these two variables is very high (0.6098).

OTHERS: Respondent is non-Muslim religious minority

(Reference category: Respondent is Hindu Forward Caste)

LCHILD: Number of living child (Continious variable)

SLINFHS: Standard of living index (Continious variable)

NFHS2: Respondent in NFHS-2, 1998-99

NFHS3: Respondent in NFHS-3, 2005-06

(reference category: Respondent in NFHS-1, 1992-93)

WBELITE: Respondent resides in urban areas, and has completed secondary level of education

WBELITE′: Respondent resides in urban areas, has completed secondary level of education, and belongs to top two SLI groups

Although duration of marriage is a very important determinant of fertility decisions and contraceptive choice, we have not included this among the explanatory variables. The reason is the high correlation between marital duration and age (0.91 at the all-India and West Bengal level), that is likely to cause multi-collinearity, distorting results.

The models are estimated for the sample of currently married women who are not currently pregnant. In Models 3 and 4, the sample is reduced further to include only urban elite (urban residents, belonging to fourth and fifth SLI quintile and with above secondary level education). Since the dependent variable is categorical (assuming three values), the multinomial logit model is the relevant functional form. The base outcome is taken to be using traditional contraceptive methods (RV313=1). Note that we are reporting relative risk ratios, not coefficients. Results for first five models are reported in Table 8. The top panel presents results for not using contraceptives, vi-a-vis using traditional contraceptives, while

the bottom panel reports results for using modern contraceptives, vi-a-vis using traditional contraceptives. The implication of the results for contraceptive choice is briefly discussed below,based on the Relative risk Ratios (RRRs) reported in Tables..

Urban residents prefer modern methods to traditional methods, while no use is considered the least preferred option. Aged respondents prefer traditional contraceptives to both not using contraceptives and modern methods, though the relation is not linear. The West Bengal urban elite, however, prefer traditional methods to not using, while their preference between modern methods and traditional methods does not change with age. Multivariate analysis indicates that degree of preference for traditional methods increases with education of respondents .

Table 8: Regression results - All-India and West Bengal currently married women

RV313	Model 1: India		Model 2: India		Model 3: Bengal		Model 4: Bengal Elite		Model 5: Bengal Elite	
	RRR	z	RRR	z	RRR	z	RRR	z	RRR	z
Choice: 0										
WBELITE							0.55	-7.08***		
WBELITE′									0.53	-7.80***
BENGAL			0.14	-48.42***						
URBAN	0.85	-6.28***	0.93	-2.93***	0.78	-2.65**				
V012	0.67	-33.66***	0.67	-33.37***	0.68	-11.30***	0.70	-13.01***	0.70	-12.80***
SV012	1.01	32.82***	1.01	32.84***	1.01	12.04***	1.01	13.65***	1.01	13.47***
PRIMARY	0.63	-12.70***	0.67	-10.90***	0.63	-4.02***				
SECONDARY	0.43	-26.30***	0.44	-25.29***	0.50	-6.01***				
HIGHER	0.33	-24.53***	0.34	-24.02***	0.43	-5.05***	1.11	0.64	1.09	0.52
PRIMARY_P	0.94	-0.90	0.89	-1.69*	0.99	-0.03	1.02	0.10	1.01	0.08
SECONDARY_P	0.89	-1.85*	0.87	-2.15**	1.21	1.02	1.33	3.24***	1.30	2.93***
HSC	0.99	-0.42	1.04	1.10	1.12	1.02	3.16	6.03***	2.98	5.71***
HST	1.55	7.48***	1.47	6.50***	2.54	3.60***	1.77	6.68***	1.73	6.34***
MUSLIM	1.29	7.07***	1.38	8.99***	1.46	3.49***	1.80	2.54**	1.80	2.53**
OTHER	1.29	7.44***	1.15	4.17***	1.78	2.15**	1.04	1.51	1.03	0.99
SLIGROUP1	1.38	8.26***	1.44	9.07***	1.57	3.45***				
SLIGROUP2	1.13	3.36***	1.14	3.53***	1.13	1.00				
SLIGROUP4	0.87	-3.99***	0.84	-4.76***	0.88	-1.09				
SLIGROUP5	0.80	-5.74***	0.72	-8.46***	0.72	-2.22**				
V218	0.92	-9.53***	0.89	-12.95***	0.99	-0.41	0.49	-3.38***	0.49	-3.35***
NFHS2	1.38	3.52***	1.33	3.15***	0.43	-3.44***	0.36	-4.80***	0.38	-4.55***
NFHS3	0.98	-0.25	0.88	-1.39	0.35	-4.13***	0.70	-13.01***	0.70	-12.80***
Choice: 2										
WBELITE							0.50	-9.45		
WBELITE′									0.53	-9.15
BENGAL			0.26	-38.47***						
URBAN	1.13	4.81***	1.21	7.54***	0.73	-3.88***				
V012	1.12	9.64***	1.12	9.52***	1.10	2.80**	1.10	3.54	1.10	3.63
SV012	1.00	-7.50***	1.00	-7.12***	1.00	-2.80**	1.00	-3.27	1.00	-3.36

RV313	Model 1: India		Model 2: India		Model 3: Bengal		Model 4: Bengal Elite		Model 5: Bengal Elite	
	RRR	z	RRR	z	RRR	z	RRR	z	RRR	z
PRIMARY	0.97	-0.94	1.02	0.41	0.81	-2.08				
SECONDARY	0.65	-13.52***	0.66	-12.90***	0.58	-5.33***				
HIGHER	0.42	-19.95***	0.42	-19.64***	0.42	-6.08***	0.95	-0.32	0.94	-0.39
PRIMARY_P	1.13	1.94**	1.08	1.21	0.86	-0.90	0.85	-1.06	0.84	-1.13
SECONDARY_P	0.96	-0.61	0.94	-0.90	0.88	-0.78	1.29	3.37	1.27	3.14
HSC	0.95	-1.56	0.99	-0.33	1.29	2.71**	1.22	1.04	1.16	0.79
HST	1.26	3.98***	1.20	3.13***	1.11	0.40	0.66	-5.23	0.65	-5.42
MUSLIM	0.61	-14.10***	0.64	-12.33***	0.61	-4.92***	0.97	-0.12	0.98	-0.11
OTHER	0.76	-8.12***	0.69	-10.85***	1.16	0.60				
SLIGROUP1	0.95	-1.19	0.98	-0.43	0.95	-0.39				
SLIGROUP2	0.91	-2.58**	0.91	-2.41**	0.87	-1.29				
SLIGROUP4	1.02	0.61	1.00	-0.13	0.78	-2.58				
SLIGROUP5	1.05	1.33	0.96	-1.20	0.89	-0.99	1.34	12.13	1.33	11.63
V218	1.10	10.93***	1.07	7.61***	1.31	9.26***	0.36	-5.35	0.36	-5.36
NFHS2	0.24	-16.97***	0.23	-17.25***	0.32	-5.09***	0.37	-5.17	0.39	-4.94
NFHS3	0.24	-17.02***	0.22	-18.01***	0.40	-4.04***	1.10	3.54	1.10	3.63
N	147068		147068		6719		6719		6719	
LR χ^2	31330.77		33486.17		1275.73		1280.72		1277.06	
PSEUDO R^2	0.12		0.13		0.09		0.09		0.09	

Note:

[1] Choice 0: Not using any contraceptives, or using folkloric methods'; Choice 2: 'using modern contraceptive methods'; 'Base outcome (Choice 1): 'Using traditional contraceptive method'.

[2] *** denotes p<0.01, ** denotes p <0.05 and * denotes p <0.10.

Occupation of partner does not have a strong and clear impact on contraceptive choice. From the top panel we can see that if partners are working in the secondary sector, traditional contraceptive methods are preferred, relative to those working in the tertiary sector. West Bengal urban elite women with partners working in the secondary sector prefer not using contraceptives, compared to those with partners working in the tertiary sector. The RRR for those working in the primary sector is significant only in Model 2; the value of the RRR (less than unity) indicates that this group prefers traditional methods. In the bottom panel, only in Model 1, is coefficient of PRIMARY_P significant. AS the RRR is less than unity, we can infer that this group prefers traditional methods.

The influence of socio-religious identity on contraceptive choice varies between India and urban elite in West Bengal. While the preferences of HSCs and HFCs do not differ significantly at the all India level, among the urban elite in West Bengal, a preference against traditional methods may be observed. HSTs either prefer not to use any methods, or prefer to use modern methods for the Indian sample. Muslims and Others prefer not to use any methods, but between traditional and modern methods, they prefer the former. This may be explained in terms of religious prohibitions and both Islam and certain sects within Christians (like Roman Catholics, Seventh Day Adventists, etc.) disapprove of contraception. Within urban elite of West Bengal, Muslims and Others are found to avoid traditional contraception, while their choice pattern between traditional and modern methods does not vary significantly.

Economic status (measured by Standard of Living Index) affects only choice between traditional methods and not using contraceptives – it does not affect choice between traditional and modern methods. While respondents belonging to the first two quintiles prefer

not using contraceptives, those belonging to the top two quintile groups, prefer traditional methods.

Respondents with larger number of children prefer traditional methods to not using any method. In case of modern versus traditional methods, respondents in the Indian sample prefer modern methods, while no significant preference is evinced by the urban elite of West Bengal.

The dummies for NFHS Rounds indicate how preference patterns are changing over time. In India, between Rounds 1 and 2, there is a shift from traditional methods to non-use, while there is a shift from modern methods to traditional methods over the three Rounds. In Bengal (Model 3) traditional methods are becoming more popular over time, though among the urban elite, there is a shift only from no-use to traditional methods.

In Model 2, the Bengal dummy is negative and significant at 1% level, indicating that respondents from this state prefer traditional contraception methods. Within West Bengal, urban elite have a strong preference towards traditional contraceptive methods (RRR is less than unity and significant at 1% level in both Models 4 and 5). Both definitions of urban elite (with or without the SLI criterion) give almost identical results. We therefore estimate Model 6 for the group WBELITE′ = 1, incorporating preferences about family size and gender composition through the variable gender parity (SEXCOMP). Thus, the model estimated is:

$$RV313 = \alpha + \beta_1 V012 + \beta_2 SV012 + \beta_3 P\_PRIMARY + \beta_4 P\_SECONDARY + \beta_5 HSC + \beta_6 HST + \beta_7 MUSLIM + \beta 8 OTHERS + \beta_9 LCHILD + \beta_{10} NFHS2 + \beta_{11} NFHS3 + \beta_{12} SEXCOMP1 + \beta_{13} SEXCOMP2 + \beta_{14} SEXCOMP4 + \beta_{15} SEXCOMP5 + \beta_{16} SEXCOMP6 + u_i \quad [6]$$

when,

SEXCOMP1: Gender parity (0, 0)

SEXCOMP2: Gender parity (1, 0)

SEXCOMP4: Gender parity (2, 0)

SEXCOMP5: Gender parity (2, 1)

SEXCOMP6: Higher order gender parity

(reference category) SEXCOMP3: Gender parity (1, 1)

Results are stated in Table 9.

Table 9: Regression results - Currently married urban elite women in West Bengal

RV313	**Choice: Folkloric/No use**			**Choice: Modern methods**		
	RRR	**z**	**Prob.**	**RRR**	**z**	**Prob.**
V012	0.42	-10.40***	0.00	0.73	-4.46***	0.00
SV012	1.01	10.78***	0.00	1.00	3.64***	0.00
PRIMARY_P	1.32	0.71	0.48	0.61	-1.71*	0.09
SECONDARY_P	1.44	1.02	0.31	0.70	-1.32	0.19
HSC	0.76	-0.95	0.34	1.01	0.04	0.97
HST	0.00	0.00	1.00	0.58	-0.54	0.59
MUSLIM	1.92	2.17**	0.03	0.91	-0.37	0.71
OTHER	0.65	-0.72	0.47	1.22	0.54	0.59
V218	1.32	1.04	0.30	1.18	0.77	0.44
NFHS2	0.19	-2.67**	0.01	0.35	-1.84**	0.07
NFHS3	0.18	-2.69**	0.01	0.46	-1.36	0.17
RSEXCOMP1	1.06	0.15	0.88	0.53	-2.00**	0.05
RSEXCOMP2	1.07	0.17	0.87	0.77	-0.83	0.41
RSEXCOMP4	1.12	0.38	0.71	1.43	1.51	0.13
RSEXCOMP5	0.68	-1.02	0.31	1.73	2.05**	0.04
RSEXCOMP6	0.66	-0.79	0.43	2.77	2.54**	0.01
N	1688.00					
LR χ^2	343.11		0.00			
PSEUDO R^2	0.10					

Note:
[1] Choice 0: Not using any contraceptives, or using folkloric methods'; Choice 2: 'using modern contraceptive methods'; 'Base outcome (Choice 1): 'Using traditional contraceptive method'.
[2] *** denotes p<0.01, ** denotes p <0.05 and * denotes p <0.10.

It can be seen that preference for traditional family planning methods increases as respondents become older, though the relation is non-linear.[22] Occupation of partner does not appear to be relevant;[23] nor is number of living child. Over time, preference for traditional methods of birth control seems to be increasing among urban elites, though preference for traditional methods and modern methods tapers off around 2005-06 (NFHS-3). Socio-religious identity is not relevant – the RRR of only MUSLIM is significant at 5% level and greater than unity. While this may be cited as support for the claim that Muslims have an aversion towards using contraceptive methods, two riders should be noted. Firstly, the sample is urban elite – a group that is a minority within Muslims (comprising only 5% within West Bengal Muslim community, which is less than among HSC, HFC and Others).

The variables in which we are most interested in are the dummy variables SEXCOMP1-SEXCOMP6. The reference category was SEXCOMP3, corresponding to a family with one son and one daughter. RRR's of families in the immediate neighbourhood (SEXCOMP2 and SEXCOMP4) are not statistically significant. What is interesting is that, coefficient of SEXCOMP1 is negative and significant at 5% level, and that of SEXCOMP5 and SEXCOMP6 are also significant at 5% level, but positive. This implies that, as hypothesized in section 4.2 (last paragraph), *childless couples (SEXCOMP0) prefer traditional methods over modern methods when the consequence of failure of traditional methods is not concerning,, while this choice gets reversed for families with higher parity (SEXCOMP5 SEXCOMP6)*. Multivariate analysis of choice of contraceptive method provides evidence that the preference of 'ultramodern contraception' is linked to son preference, which has

[22] This may reflect declining sexual activity with age. The infrequent intervals at which sexual activity occur – the suddenness and unpremeditated nature of the act – means that women have to rely on methods that can be employed without the need for prior preparation. This may create a preference for traditional methods like *coitus interruptus*.

[23] Women whose partners are engaged in primary sector display a weak preference towards traditional methods over modern methods, in comparison to women with unemployed partners. This effect is significant at 10% level.

traditionally been observed to guide fertility decisions in South Asia (Stash, 1996; Arnold et al., 1998; Arnold, 2001; Clark, 2000; Das Gupta et al., 2002; Dutta and Husain, 2011; Jayaraman et al., 2009; Pande, 2003).

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5. Conclusion

To conclude, modern contraceptives have been promoted by policy makers in developing countries with a view to reduce fertility and control spread of RTI/STI. However, some of these methods have serious side effects and their invasive nature often creates inconveniences for users (Sedgh et al. 2007; Rajaretnam and Deshpande 1994). Further, methods like IUD require the assistance of paramedical/medical personnel, reducing their popularity. Specific methods have often aroused controversy due to their adverse side effects and forcible nature of implementation.[24] In this context, Basu (2005) claims that 'ultramodern' contraceptives offer a choice of methods that are reliable, do not have any adverse medical side effects and may be conveniently used by the couple possessing necessary skill/knowledge. Thus, they appear to be superior to modern contraceptives.

Analysis of NFHS data from 1992-93 to 2005-06 for West Bengal, an Indian state where usage of traditional contraceptive is high, does not provide conclusive evidence in support of this arguement. Our findings reveal that traditional contraceptives is indeed substantially high among the urban, educated and affluent class. Moreover, such women are equally concerned about controlling their fertility as those using modern methods. This would imply that policy makers can offer a safer, non-invasive substitute for modern birth control methods in the form of 'ultramodern methods' by educating dyads about fertility cycles through social grass-root level activists (called Accredited Social Health Activists, ASHAs) and encouraging

[24] Controversies over forced vasectomy in India during the Emergency, Norplant-R in the 1990s, and recent anecdotal evidence that sterilization is occurring without informed consent of women may be mentioned in this context.

target women to rely on traditional contraception methods. This is important given that modern invasive methods (notably intra-uterine devices) is often viewed with suspicion by poorer and less-educated women) in India. However, such policies have to be handled carefully.[25]

Analysis of gender parity and choice of contraceptive methods indicate that it is son preference motivating choice of contraceptive methods over the reproductive cycle. Initially the urban elite may prefer less invasive contraceptive methods without side effects – even if they are less reliable. Once couples attain targetted family *size* and *composition* – so that failure of traditional methods have substantial economic and other costs - greater weightage is assigned to reliability, with a shift to modern contraceptive methods. This calls for a closer examination of the underlying motives shaping contraceptive choice *over the reproductive life cycle*.

Moreover, even the urban elite, particularly in developing countries, may often lack the skill and knowledge to practice traditional methods effectively. In such cases, the couple may have to rely on emergency contraception, or go for induced abortion – both of which are detrimental for reproductive health, fecundity and mental health of the women. Thus, promoting or allowing reliance on traditional contraceptives is a viable policy option only if accompanied by provisioning of adequate knowledge about fertility cycles. In addition, if the woman has more than one sexual partner – a phenomenon which has been observed to increase sharply in recent years in urban areas of developing countries - using traditional methods may increase the probability of RTI/STI and HIV/AIDS.

[25] For instance, policy makers may offer incentives to have daughters. Information about ovulatory cycles and about STI/RTI also has to be provided.

This calls for closer examination of issues like whether users of traditional birth control methods possess sufficiently knowledge and skill to use these methods successfully, what is the incidence of emergency contraception and induced abortion among users of traditional and modern methods, and their health impact. Unfortunately, answers to such questions cannot be obtained from the limited information provided in the NFHS data set. A large scale primary survey is necessary for this purpose. Apart from such regional studies, it is also necessary to undertake cross-country comparisons focussing on countries exhibiting a high extent of reliance on traditional methods. We need to examine the common factors, if any, between users, whether differences in socio-economic factors contribute to varying levels of effectiveness, and the role of culture in contraceptive choice. Such refinement of the present study is left as a task for the future.

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