

Determinants of Contraceptive Method Choice in an Industrial City of India

*A report on a special programme offering a
'cafeteria approach' to method selection*

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Even though India instituted the first national family planning programme in the world, its contraceptive prevalence rate is still relatively low. In 1980, a national survey estimated that 35 per cent of the currently

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married women aged 15-44 years were currently using contraceptives, of whom 63 per cent were using sterilization (Khan and Prasad, 1983, pp. 112, 120). As late as 1984-1985, close to the time our study was carried out, official government estimates based on service statistics still showed only 36 per cent of the eligible couples as being currently protected (Ministry of Health and Family Welfare, Government of India, 1986, p. 14); of these, 70 per cent were using sterilization (*Ibid.*, p. 187).

India's national programme has had a history of emphasizing particular contraceptive methods. In recent years, the programme first emphasized the IUD, then shifted to male sterilization, then switched to female sterilization, and lately is promoting female sterilization and the IUD (see, for example, Rele *et al.*, 1989; Cassen, 1978: chapter 3; Srikantan *et al.*, 1984) and is moving towards a "cafeteria approach" (Palmore and Bulatao, 1989, p. 20). Not surprisingly, in this context, little research has been carried out on the determinants of contraceptive method choice. When there is limited choice, and the primary concern of policy makers is motivating couples to use any method at all, research on method choice has low salience (Palmore and Bulatao, 1989; Tsui, 1989; Mundigo *et al.*, 1989).

In a few areas of India, however, special programmes have offered a "cafeteria approach" to method selection. This article deals with one such programme: the TISCO (Tata Iron and Steel Company) Family Welfare Programme in Jamshedpur, an industrial city in Bihar State. By the early 1980s, Jamshedpur had a crude birth rate under 20 (table 1) and close to 60 per cent current contraceptive use (table 2).

The TISCO Programme^{1/}

Since 1958, TISCO has been involved in the family welfare programme of Jamshedpur, covering not only employees of the company but also serving non-employees living in the same area. The total population covered by the TISCO programme exceeded half a million (553,000) at the time of this study, with 438,000 in the Jamshedpur Notified Area, 40,000 in rural areas served by the Tata Steel Rural Development Society, and 75,000 in peripheral areas.

The programme provided both clinical services and motivational and educational programmes. The clinical services included nine centres in addition to regular government clinics, with contraceptive counselling for conventional contraceptives and the IUD, and two clinics providing vasectomy on a regular basis. "Camps" at all the clinics provided periodic vasectomy and laparoscopic tubectomy services.

Table 1: Selected demographic characteristics of Jamshedpur and India as a whole

	Jamshedpur (1982-1984)	India (1982)	India's goal for the year 2000
Crude birth rate	19.81	34.	21.
Total fertility rate	2.37	4.72 (rural) * 3.31 (urban) *	
Crude death rate	7.	12.	9.
Infant mortality rate	39.	114.	60.

Sources: Bhende *et al.*, 1985 and Ministry of Health and Family Welfare, Government of India, 1986.

* *Note:* For 1980.

Table 2: Percentage currently using contraceptives, by method, Jamshedpur and India as a whole

	Jamshedpur 1984		India	
	All women	Exposed women	1982-83	1983-84^{a/}
Female sterilization	23	26	22	24
Male sterilization	11	13		
Condom	9	10		
Female temporary method	5	6		
Natural methods	10	11		
Any method^{b/}	59	66	28	33

Sources: Bhende *et al.*, 1985 and Ministry of Health and Family Welfare, Government of India, 1984, p. 147. The figures for India as a whole refer to currently married women aged 15-44.

Notes: ^{a/} Provisional;

^{b/} Owing to rounding, the percentage for any method may not be equal to the sum of the percentages for individual methods.

The motivational and educational programmes were many and included such innovations as a dance drama on family planning, a recorded cassette programme of satisfied family planning acceptors, a birth rate competition among the various departments of TISCO, training camps for opinion leaders, special orientation programmes for officers and staff of welfare agencies in the city, family life education, and a special programme for future parents.

The TISCO programme also offered higher incentives for acceptors than did the national programme. Beginning in 1967, 200 rupees (US\$1.00 = then about Rs7.5) was offered to sterilization acceptors who were TISCO employees. Beginning in 1970, non-employees were offered Rs100. Later these incentives were increased, and by 1983 they had become Rs.500 (US\$1.00 = then about Rs10.9) for employees and Rs400 for non-employees. Employees were also granted leave of one day for a vasectomy and seven days for a tubectomy. For IUD acceptance, the incentive was Rs12. Further, sterilization motivators received Rs20 per case motivated.

Data and methods

In 1983, TISCO commissioned an independent evaluation of its programme by the International Institute for Population Sciences (IIPS), Deonar, Bombay. IIPS used both clinical records and a sample survey of the Jamshedpur Notified Area conducted in 1984. In this article, only the data from the survey are used.

Full details on the sample survey are provided in the final report published by IIPS and, hence, are not repeated here. What is important for our purposes is that the sample survey was a probability sample of the city, although a few areas of the city were excluded.²⁷ In all, 2,376 currently married women in the age group 15-44 were interviewed (Bhende *et al.*, 1985). What makes these data useful for our purposes is the fact that contraceptive acceptance levels in Jamshedpur were higher than the national level and no single method dominated acceptance, hence providing a rare look at what determines contraceptive method choice in the Indian context when true choice is really possible (table 2).

The determinants of contraceptive method choice can be identified and elaborated using multivariate analysis. To decide which variables to include as potential determinants, we were guided by the framework proposed by Rodolfo Bulatao (1989), who proposed four dimensions:

- Contraceptive goals (spacing or limitation);

- Contraceptive competence (the ability to use methods effectively);
- Contraceptive evaluation (assessment of the moral and practical aspects of using a specific method -- including side effects); and
- Contraceptive access (including not only geographic but also economic and other aspects of accessibility)

As might be expected, our final set of covariates are mostly indirect measures of Bulatao's dimensions. Those we used are listed below:

<u>Contraceptive goals:</u>	<u>Contraceptive competence:</u>
number and sex of living children	husband's education
marriage duration	wife's education
ideal age to have last child	<u>Contraceptive evaluation:</u>
want more children or not	religion
whether or not a large family is considered advantageous	ethnicity - mother tongue
whether last child died	<u>Contraceptive access:</u>
	husband's occupation
	husband's place of employment

Husband's occupation and place of employment were treated as contraceptive access variables because of the ready accessibility provided to TISCO and other Tata employees. The covariates and their distributions in the sample are summarized in [table 3](#). All analyses were limited to "exposed" women: women were excluded if they were currently pregnant, not pregnant but in post-partum amenorrhea, or had reached menopause.

The statistical model used for the analysis was multinomial logit regression (Maddala, 1983; Choe, 1989). The method is appropriate for studying the relationships between a number of covariates and a dependent variable that has more than two possible outcomes. The contraceptive method currently used is the dependent variable, with the possible outcomes being female sterilization, male sterilization, condom, female temporary method, natural methods, and no method. In the Indian context, it is important to separate the male and female methods not only for obvious cultural reasons but also because of different promotional strategies that have been used.

Table 3: Characteristics of exposed women in the survey

Region/caste	Muslim	13%
	Hindu/scheduled caste	12%
	Hindu/other	75%
Mother tongue	Hindi, Urdu	43%
	Bengali, Oriya	34%
	Southern Indian	11%
	Punjabi	8%
	Other	4%
Husband's occupation	Professional, managerial	33%
	Skilled and unskilled workers	54%
	Other	13%
Husband's employer	TISCO	30%
	Other Tata	33%
	Others	37%
Women's age at consummation of marriage	Less than or equal to 15	32%
	16 to 19	41%
	20 or older	27%
Husband's average years of formal education		10.1 years
Women's average years of formal education		7.1 years
Average marriage duration		13.9 years
Number and sex of children	No children	7% living
	Have children, no sons	13%
	One son	35%
	Two or more sons	45%
Last-born child has died		9%
Ideal age at which to have last child:	30 years or younger	24%
Want no more children		72%
Not advantageous to have a large family		85%

The inclusion of sterilization among the choices could introduce methodological problems for two reasons. Many of these decisions could have been made in the past. This is potentially problematic because Bihar, the State where Jamshedpur is located, was one of the States where the national, compulsory, extensive sterilization efforts of 1975-1978 were most heavily emphasized; hence we could be looking at choices not made in a "cafeteria" environment. It is also potentially problematic because choices in the past would mean that some of the covariates, all of which were measured as of 1984, would be referring to times after the choices had been made. After examining the reported dates of sterilization in our data set,

however, we decided that these problems would be minimized. In our data set, most of the sterilizations among women occurred after that national campaign, with the largest single number of sterilizations having occurred in 1980.

The full model included some attitudinal variables. Recognizing that the effects of some background variables (e.g. religion, mother tongue, husband's occupation, husband's education and wife's education) operate in part through these attitudes, including the attitude variables in the model could lead to an over-adjustment of the total effects of these background variables. A reduced model is therefore also presented, without the attitude variables, to show the total effects of the background variables after adjusting for the other variables in the model. Together the two models help to separate the total effects of each of the background variables into their direct effects and the indirect effects operating through the attitude variables. In this article, the outputs for the two models are viewed from this perspective, and, wherever indicated, the effects are identified and discussed.

Results

The results for the full model are given in [tables 4 and 5](#). [Table 4](#) gives regression coefficients, with significance at p.05 indicated by an asterisk. Using these coefficients, the adjusted proportions, using each method for different values of any given covariate and assuming average values for all other covariates in the model, can be estimated. These proportions are given in [table 5](#). Similarly, the results of the reduced model, excluding the attitude variables, are given in [tables 6 and 7](#). A detailed discussion of the effects of each of the covariates on contraceptive use and method choice based on these analyses follows.

Religion/caste

This covariate is divided into three categories: Muslims, Hindu scheduled castes, and the remaining majority of the population consisting of Hindu other castes and others. The analysis indicates that Muslims and the Hindu scheduled castes show significantly lower contraceptive use than the majority group comprising 75 per cent of the population. It also shows that Muslims seem to prefer non-permanent and natural methods, with significantly lower use of both male and female sterilization. The attitudinal variables seem to explain a major part of their lower use of female sterilization: the differential in the use of female sterilization is no longer statistical-

Table 4: Multinomial logit regression coefficients for P (using a given method)/P (using no method)^{a/}

Covariate	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
Religion is Muslim	-0.48164	-0.88420 *	-0.06366	-0.00193	-0.39296
Religion is Hindu; person is from scheduled caste	-0.51417	-0.05295	-0.60647	-0.18334	-0.62828
Mother tongue is:					
Bengali, Oriya	0.15175	0.17574	0.33885	0.51852	1.02211 *
Southern Indian	0.40088	0.24004	0.27890	0.71015	0.60222 *
Punjabi	-0.10268	0.00854	0.65076	0.68457	0.41579
Other language	-0.15471	-0.23981	0.78491	1.02101	1.37980 *
Husband's occupation:					
Manager/professional	-0.18648	0.12245	0.30994	-0.36230	-0.05218
Other	0.05757	0.15864	-0.70320 *	0.26899	-0.23488
Place of employment:					
TISCO	0.52432 *	0.79411 *	0.33865	0.72075 *	0.35650
Other Tata	0.44854 *	0.70497 *	0.26070	0.45831	0.11169
Age at consummation:					
≤ 15years	0.23317	0.33873	-0.26656	0.76988 *	-0.08154
16 - 19years	0.09971	-0.16508	-0.32178	0.31689	-0.03216

Table 4: (continued)

Covariate	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
Husband's education (no. of years of formal education)	0.01705	0.00481	0.00442	0.05062	0.07948 *
Wife's education (no. of years of formal education)	-0.01848	0.01967	0.16705 *	0.17914 *	0.10416 *
Duration of marriage (years)	0.11788 *	0.05433	-0.07318	-0.14620 *	0.06137
Duration of marriage squared	-0.00522 *	0.00008	0.00047	0.00231	-0.00184
Have no children	-1.61407 *	-1.15373	-0.86528	-0.78924	-1.20820
Have children, no sons	-1.50999 *	-1.39279 *	0.03045	0.47870	0.01175
Have one son	-1.20243 *	-1.12677 *	-0.21003	-0.38009	-0.42431 *
Last-born child dead	-0.04710	-0.48626	-0.55828	-1.18611	-0.33486
Ideal age at which to have last child: 30 years or less	0.40886 *	0.32821	0.26756	0.31509	0.04886
Want no more children	3.30426 *	2.57879 *	1.43486 *	2.70811 *	1.42349 *
Advantageous to have large family	0.26741	0.58990 *	0.63933 *	0.63338 *	0.18905

Notes: a/ Estimated coefficients for any other comparisons can be computed by subtraction.

* = Significant at p.05.

Table 5: Adjusted proportions using each method for selected groups^{a/}

Group	No method	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
All	0.3510	0.2688	0.1187	0.0938	0.0467	0.1209
Religion is Muslim	0.4227	0.2266	0.0668	0.1150	0.0574	0.1116
Religion is Hindu; person is from scheduled caste	0.4235	0.2197	0.1536	0.0669	0.0479	0.0884
Other religion	0.3260	0.2829	0.1247	0.0945	0.0443	0.1275
Mother tongue is:						
Hindi, Urdu	0.3947	0.2785	0.1236	0.0839	0.0370	0.0824
Bengali, Oriya	0.3096	0.2542	0.1155	0.0924	0.0487	0.1796
Southern Indian	0.3026	0.3188	0.1204	0.0850	0.0577	0.1154
Punjabi	0.3494	0.2225	0.1103	0.1424	0.0649	0.1106
Other language	0.2935	0.1774	0.0723	0.1368	0.0763	0.2436
Religion Muslim, language Hindi or Urdu	0.4735	0.2338	0.0692	0.1024	0.0453	0.0757

Table 5: (continued)

Group	No method	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
Husband's occupation:						
Skilled/non-skilled	0.3452	0.2791	0.1099	0.0912	0.0500	0.1247
Manager/professional	0.3528	0.2367	0.1269	0.1271	0.0355	0.1210
Other	0.3527	0.3020	0.1316	0.0461	0.0668	0.1008
Place of employment:						
TISCO	0.2983	0.2850	0.1398	0.0929	0.0566	0.1273
Tata	0.3244	0.2873	0.1391	0.0934	0.0474	0.1084
Other	0.4183	0.2366	0.0886	0.0928	0.0386	0.1250
Age at consummation:						
≤ 15 years	0.3228	0.2780	0.1468	0.0821	0.0635	0.1067
16 - 19 years	0.3648	0.2749	0.1002	0.0878	0.0456	0.1266
≥ 20 years	0.3587	0.2446	0.1163	0.1192	0.0327	0.1286

Table 5: (continued)

Group	None method	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
Education of husband:						
0 years	0.4072	0.2624	0.1312	0.1041	0.0324	0.0627
4 years	0.3864	0.2666	0.1269	0.1006	0.0377	0.0818
7 years	0.3690	0.2684	0.1232	0.0975	0.0420	0.0993
12 years	0.3392	0.2683	0.1158	0.0915	0.0496	0.1357
Education of wife:						
0 years	0.4082	0.3567	0.1200	0.0331	0.0151	0.0669
4 years	0.3828	0.3107	0.1217	0.0606	0.0290	0.0951
7 years	0.3526	0.2707	0.1190	0.0922	0.0458	0.1198
12 years	0.2805	0.1964	0.1044	0.1690	0.0892	0.1604
Marriage duration:						
5 years	0.3193	0.2793	0.0655	0.1469	0.0922	0.0968
10 years	0.3133	0.3341	0.0848	0.1036	0.0518	0.1124
15 years	0.3229	0.3234	0.1159	0.0785	0.0343	0.1251
20 years	0.3517	0.2549	0.1680	0.0644	0.0269	0.1341

Table 5: (continued)

	None method	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
Last born child: died	0.4147	0.3043	0.0901	0.0667	0.0187	0.1054
Last born child: living	0.3440	0.2646	0.1216	0.0967	0.0509	0.1222
Have no children	0.5412	0.1709	0.1110	0.0695	0.0371	0.0703
Have children, no sons	0.3984	0.1396	0.0643	0.1252	0.0972	0.1753
Have one son	0.4306	0.2052	0.0907	0.1064	0.0445	0.1225
Have two or more sons	0.2423	0.3843	0.1575	0.0739	0.0366	0.1054
Ideal age at which to have last child:						
≤ 30	0.2998	0.3137	0.1303	0.0983	0.0507	0.1072
> 30	0.3672	0.2553	0.1149	0.0922	0.0453	0.1251
Want no more children	0.2090	0.3985	0.1441	0.0830	0.0587	0.1067
Want more children	0.7361	0.0515	0.0385	0.0696	0.0138	0.0905
Advantageous to have large family	0.4275	0.2605	0.0874	0.0662	0.0331	0.1253
Not advantageous to have large family	0.3380	0.2692	0.1246	0.0992	0.0493	0.1197

Note: a/ The adjusted proportions are estimated by setting covariates included in the model but not specified by the row heading at their sample mean values.

Table 6: Multinomial logit regression coefficients for P (using a given method)/P (using no method) (reduced model)^{a/}

Covariate	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
Religion is Muslim	-0.87694 *	-1.26757 *	-0.35285	-0.40155	-0.55315
Religion is Hindu; person is from scheduled caste	-0.72774 *	-0.24477	-0.74249 *	-0.38231	-0.71055 *
Mother tongue is :					
Bengali, Oriya	0.17810	0.19420	0.34533	0.53864	1.03652 *
Southern Indian	0.41871	0.24879	0.27462	0.72106	0.61712 *
Punjabi	-0.14636	-0.03719	0.60783	0.63919	0.40799
Other language	0.01147	-0.08679	0.88323	1.18481 *	1.46565 *
Husband's occupation:					
Manager/professional	-0.21668	0.10980	0.31044	-0.37466	-0.06079
Other	0.10348	0.20079	-0.67037 *	0.31186	-0.22090
Place of employment:					
TISCO	0.47000 *	0.75346 *	0.31960	0.67730 *	0.32986
Other Tata	0.31497	0.60578 *	0.20555	0.35590	0.06190

Table 6: (continued)

Covariate	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
Age at consummation:					
≤ 15 years	0.12390	0.24942	-0.31748	0.67514 *	-0.13285
16 - 19 years	0.10206	-0.16374	-0.31845	0.31713	-0.03620
Husband's education (no. of years of formal education)	0.01652	0.00566	0.00645	0.05137	0.07864 *
Wife's education (no. of years of formal education)	0.02110	0.05235 *	0.18758 *	0.21318 *	0.12008 *
Duration of marriage (years)	0.31084 *	0.20666 *	0.01183	0.01428	0.14676 *
Duration of marriage squared	-0.00936 *	-0.00329 *	-0.00151	-0.00125	-0.00369 *
Have no children	-2.46950 *	-1.81067 *	-1.21910	-1.47989	-1.57964 *
Have children, no sons	-2.32824 *	-2.00002 *	-0.28419	-0.15692	-0.33075
Have one son	-1.41187 *	-1.25335 *	-0.25116	-0.51137 *	-0.50607 *
Last-born child dead	-0.35459	-0.69946	-0.65917	-1.40745	-0.45531

Notes: ^{a/} Estimated coefficients for any other comparisons can be computed by subtraction.
* = Significant at p.05.

Table 7: Adjusted proportions using each method for selected groups (reduced model)^{a/}

Group	No method	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
All	0.3647	0.2784	0.1139	0.0866	0.0454	0.1110
Religion is Muslim	0.5041	0.1960	0.0539	0.0962	0.0463	0.1033
Religion is Hindu; person is from scheduled caste	0.4658	0.2103	0.1386	0.0602	0.0436	0.0816
Other religion	0.3247	0.3035	0.1234	0.0882	0.0446	0.1157
Mother tongue is:						
Hindi, Urdu	0.4103	0.2845	0.1174	0.0773	0.0355	0.0750
Bengali, Oriya	0.3220	0.2668	0.1119	0.0857	0.0478	0.1659
Southern Indian	0.3139	0.3309	0.1152	0.0778	0.0559	0.1063
Punjabi	0.3760	0.2252	0.1037	0.1301	0.0617	0.1033
Other language	0.2862	0.2008	0.0751	0.1304	0.0811	0.2265
Religion Muslim, language Hindi or Urdu	0.5587	0.1974	0.0548	0.0846	0.0358	0.0688

Table 7: (continued)

Group	No method	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
Husband's occupation:						
Skilled/non-skilled	0.3583	0.2899	0.1051	0.0837	0.0484	0.1145
Manager/professional	0.3716	0.2421	0.1217	0.1184	0.0345	0.1117
Other	0.3551	0.3186	0.1273	0.0424	0.0656	0.0910
Place of employment:						
TISCO	0.3102	0.2970	0.1347	0.0861	0.0552	0.1167
Other Tata	0.3497	0.2868	0.1311	0.0867	0.0452	0.1006
Other	0.4227	0.2530	0.0864	0.0853	0.0382	0.1143
Age of consummation:						
≤ 15 years	0.3491	0.2780	0.1379	0.0761	0.0603	0.0986
16 - 19 years	0.3718	0.2897	0.0971	0.0810	0.0449	0.1156
≥ 20 years	0.3675	0.2586	0.1131	0.1100	0.0323	0.1185

Table 7: (continued)

Group	No method	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
Education of husband:						
0 years	0.4212	0.2720	0.1242	0.0937	0.0311	0.0578
4 years	0.4002	0.2761	0.1207	0.0913	0.0363	0.0753
7 years	0.3834	0.2779	0.1176	0.0892	0.0406	0.0913
12 years	0.3530	0.2779	0.1114	0.0848	0.0483	0.1245
Education of wife:						
0 years	0.4784	0.3142	0.1028	0.0298	0.0130	0.0618
4 years	0.4195	0.2997	0.1111	0.0553	0.0267	0.0876
7 years	0.3673	0.2796	0.1138	0.0850	0.0444	0.1100
12 years	0.2676	0.2264	0.1078	0.1582	0.0939	0.1461

Table 7: (continued)

Group	None method	Female sterilization	Male sterilization	Condom	Female methods	Natural methods
Marriage duration:						
5 years	0.4668	0.1872	0.0490	0.1402	0.0678	0.0889
10 years	0.3449	0.3245	0.0796	0.0982	0.0490	0.1038
15 years	0.2787	0.3853	0.1197	0.0697	0.0364	0.1102
20 years	0.2703	0.3439	0.1834	0.0551	0.0305	0.1168
Last-born child died	0.4798	0.2653	0.0793	0.0625	0.0166	0.0965
Last-born child living	0.3532	0.2784	0.1175	0.0890	0.0499	0.1120
Have no children	0.6673	0.1134	0.0776	0.0578	0.0256	0.0583
Have children, no sons	0.5098	0.0998	0.0490	0.1125	0.0735	0.1554
Have one son	0.4391	0.2149	0.0891	0.1002	0.0444	0.1123
Have two or more sons	0.2172	0.4361	0.1543	0.0637	0.0366	0.0922

Note: a/ The adjusted proportions are estimated by setting covariates included in the model but not specified by the row heading at their sample mean values.

ly significant when the attitudinal variables are included. The lower use of female sterilization among Muslims seems to be due to their family-size objectives. Muslims also use male sterilization less; this finding persists even with the inclusion of the attitude variables. This apparently leads to their preference for non-permanent and natural methods, especially the condom. The lower contraceptive use among the Hindu scheduled castes is essentially due to their lower use of female sterilization, condoms and natural methods.

Mother tongue

The speakers of Hindi/Urdu languages show the lowest use of contraception, while the highest use is found among those classified as "others". The high prevalence among the latter is essentially due to their greater use of natural methods. When the natural methods are excluded, the highest use is found among speakers of South Indian languages who prefer female and male sterilization, while the Bengali/Oriya speakers show the lowest prevalence. A special preference for the condom is displayed by the speakers of Punjabi and "other" languages, and by Muslims. The differentials in contraceptive use according to mother tongue remain essentially unaltered whether or not attitudinal variables are included in the model. Hence, the observed differences in contraceptive use and choice by mother tongue are for reasons other than their family-size preference.

When religion and mother tongue are combined, the results reveal the stark finding that Hindi/Urdu-speaking Muslims show consistently low contraceptive use for all methods. This emphasizes the possible influence of the socio-religious environment on contraceptive acceptance. This result is not due to differentials in knowledge: there are no significant differences in the awareness of contraceptives in general between Muslims and other religious groups. When non-users were asked about the reasons for not using contraception, Muslims often replied: "It is against my religion" (Bhende *et al.*, 1985). The need for specialized programmes for special groups is obviously suggested by the findings above.

Husband's occupation

Husband's occupation is divided into three categories: managers/professionals, skilled/non-skilled workers and others. Husband's occupation does not affect the overall use of contraception, but it does seem to influence method choice. Managers/professionals tend to prefer the condom, while female sterilization is preferred by the "others".

Place of employment

Place of employment has three categories: employees of TISCO, other Tata, and others. The TISCO and other Tata employees show significantly higher contraceptive acceptance than the others. This is especially due to their higher acceptance of both male and female sterilization. The special TISCO programme, described previously, seems to have worked.

Age at consummation of marriage

One of the distinguishing features of Indian family-building norms is an early age at marriage. Because of this, the age of actual consummation of marriage is often separated from the age of marriage by a special ceremony which takes place sometimes months or years after the age at marriage. Owing to its demographic significance, what is considered here is the age at consummation of marriage. This variable does not, however, have much effect on overall contraceptive use, although it does affect method choice to some extent. Females whose age at consummation of marriage is less than 15 show a higher use of sterilization, whereas when age at consummation is 20 years or above, the couples tend to display a selective preference for condoms at the cost of female methods.

Husband's education

Husband's education shows a moderate positive association with the overall use of contraception. This results entirely from the strong positive relationship of the husband's education with the use of natural methods. When the natural methods are excluded, there is no relationship between husband's education and contraceptive use.

Wife's education

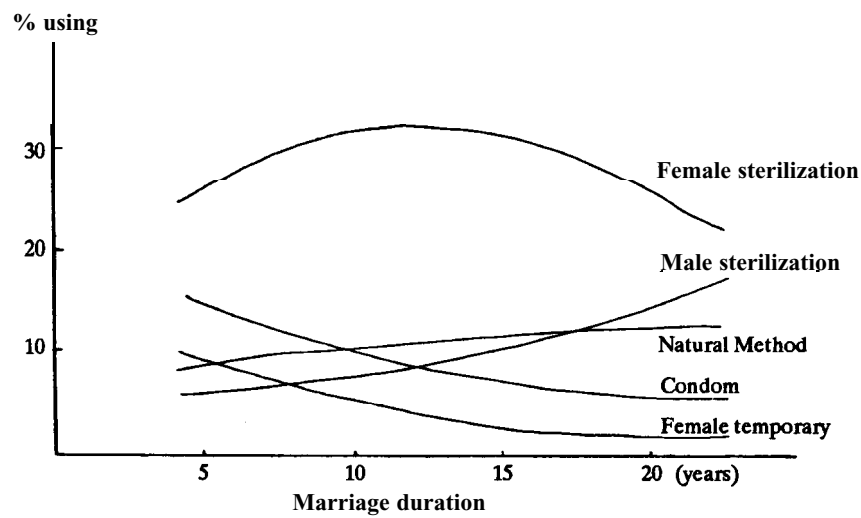
Wife's education shows a strong positive relationship with the overall use of contraception. Interestingly enough, this arises from strong positive relationships with all non-permanent methods, and negative relationships with male and female sterilization.^{3/} As in the case of husband's education, if the natural methods are excluded, the level of overall use of contraception by wife's education remains more or less constant. When the attitudinal variables are deleted from the model, it reduces the negative relationship of wife's education with male and female sterilization, and makes the positive relationship with the overall use of contraception even stronger. This indicates that a part of the influence of wife's education on contraceptive use operates through more favourable attitudes towards the small family norm with higher education.

The effect of wife's education is much stronger than the effect of husband's education on both overall use and method choice. The effect of wife's education on whether or not the couple chooses temporary methods over permanent methods is particularly noticeable. This might be interpreted as reinforcing the importance of contraceptive competence and contraceptive evaluations in method choice.

Marriage duration

In the full model, overall contraceptive use remains remarkably constant up to 20 years of marriage duration, with a slight drop thereafter. This slight drop after 20 years of marriage duration is due essentially to a corresponding drop in female sterilization. With this exception, generally with advancement of marriage duration, there is a gradual shift from temporary methods to male and female sterilization, as would be expected. Looking at the individual methods, female sterilization has an "inverted-U" relationship, male sterilization has an accelerated positive relationship, condom and female temporary methods show a downward trend, and natural methods show a very mild upward trend with marriage duration (see figure).

Figure: Contraceptive method choice by marriage duration



In the reduced model without the attitude variables, there appears to be a strong positive association of marriage duration with overall contraceptive use. Also the relationships with male and female sterilization are accentuated. This clearly indicates the influence of the attitude variables in these relationships. As women advance in marriage duration (and age) and fulfill their family size ideals, they are more likely to “want no more children”, and resort to permanent methods.

Survival status of last child

The survival status of the last child does seem to affect the use of contraception, but the effect is not statistically significant. This may be due to the small number of deaths among children in the Jamshedpur population. Also, it is apparent that the effect of this covariate is suppressed owing to adjustment for the number and sex of living children, because, in an alternative model where the latter covariate is removed, the effect of the survival status of the last child becomes significant. Women whose last child was living had higher contraceptive acceptance in general and for all individual methods, with the exception of female sterilization.

Number and sex of living children

The use of contraception tends to rise as the number of children, and especially the number of sons, goes up. Thus, a very high proportion of women having two or more living sons are current users of contraception, with a singular focus on male or female sterilization. The influence of the sex of the last child was also assessed in one model, but no clear result emerged. The use of sterilization among women with no children seems surprisingly high. Two factors may explain this unusual fact. First, it is possible that in some cases children may have died after the wife was sterilized. Second, and perhaps a more important factor, is that in the process of statistical adjustment, the group is very artificially defined as having the mean values of all other covariates in the model, such as a marriage duration of 14 years and 72 per cent wanting no more children. Thus, in the reduced model without the attitude variables, the proportion of users in the no children category is somewhat reduced.

Attitude variables

The attitude variables are very strong indicators of the use or non-use of contraception, as well as method choice. Women who want no more children show significantly higher contraceptive acceptance in total and for all individual methods. Women who indicated the ideal age to have their

last child as 30 years of age or less had higher contraceptive acceptance, especially for female sterilization. Women who felt it was not advantageous to have a large family also showed higher contraceptive prevalence, through the use of male methods (male sterilization and condom). Each of these attitude variables seems to have made very specific contributions to contraceptive acceptance and method choice. The attitude variables are also important because the effects of some of the background variables on contraceptive use and method choice operate through these attitude variables.

Summary and conclusions

For most of India, studies of method choice have not been possible because overall acceptance rates are low and are dominated by one method. Jamshedpur provides an interesting contrast, with high overall levels of contraceptive use and method choices more nearly approaching the “cafeteria” ideal.

In the Jamshedpur context, our multinomial logit analysis revealed a number of important results. Religion and caste are important determinants of acceptance and method choice. Muslims and the Hindu scheduled castes showed significantly lower contraceptive use than the majority population. Muslims seem to prefer non-permanent (condoms) and natural methods and have significantly lower use of both male and female sterilization. It is thought that this is a result of both their family-size preferences as well as more direct religious influences. The lower contraceptive use among the Hindu scheduled castes is essentially due to their lower use of female sterilization, condoms and the natural methods.

Mother tongue also has a substantial influence on contraceptive use and method choice. Hindi/Urdu-speakers have the lowest contraceptive use, although they have significant sterilization use. The Bengali/Oriya-speakers show a special preference for natural methods, Punjabis for condoms, and South Indians for sterilization. Interestingly enough, when religion and mother tongue are combined, it brings out the stark finding that Hindi/Urdu-speaking Muslims show consistently low contraceptive use for all methods. This emphasizes the influence of the socio-religious environment on contraceptive acceptance, and suggests the need for specialized programmes for special groups.

Husband’s occupation does not affect the overall use of contraception, but it does have some influence on method choice. Place of employment, on the other hand, has substantial effects. TISCO and other Tata employees

show significantly higher contraceptive acceptance than others. This is especially due to their higher acceptance of both male and female sterilization. This result clearly points to the superior family welfare programmes of the TISCO and other Tata groups.

Husband's education shows a moderate positive association with the overall use of contraception, but this is entirely due to its strong positive relationship with the use of natural methods. Strikingly, wife's education shows a strong positive relationship with the overall use of contraception. This arises from strong positive relationships with all non-permanent methods, and negative relationships with male and female sterilization. Part of the influence of wife's education on contraceptive use operates through more favourable attitudes towards the small family norm with rises in education.

Overall contraceptive use remains remarkably constant up to 20 years of marriage duration, with a slight drop thereafter. The drop in later years is conceivable when the women consider themselves to be sub-fecund, and they resort more to natural methods. Simultaneously, the use of contraception tends to rise as the number of children, especially sons, goes up. Women whose last child was living had higher contraceptive acceptance in general and for all individual methods, with the exception of female sterilization.

Clearly then, the Jamshedpur population did exercise choice in clear patterns when the choices were made available. As the national programme moves closer to the "cafeteria" ideal, it may become possible to observe whether or not the choice patterns in Jamshedpur will be found in other areas of the country and whether the high levels of overall use in Jamshedpur are at least partly due to the fact that choices were offered.

Footnotes

1. This discussion relies heavily on Bhende *et al.*, 1985, pp. 1-3.
2. Jungsalai, Parsudi, Khasmahal, Mango and Shastri Nagir were not included.
3. Note that in table 4 the multinomial logit regression coefficient for male sterilization is positive (0.01967), but the trend in table 5 is slightly negative (0.1200, 0.1217, 0.1190 and 0.1644, respectively). The former is misleading and occurs because the base category, which is of no use, shows a steeper negative trend (0.4080, 0.3838, 0.3526, 0.2805). The ratios $1200/4082 = 0.2940$; $1217/3828 = 0.3179$; $1190/3526 = 0.3372$; $1044/2805 = 0.3722$ show the apparent positive trend seen in the table.

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