MODERN CONTRACEPTIVE USE AMONG ILLITERATE WOMEN IN INDIA DOES PROXIMATE ILLITERACY MATTER?

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Illiterate women comprise a particularly vulnerable section of the community. They lack empowerment, are unable to voice their choice with respect to, inter alia, contraceptive use, and also lack access to health services. However, their lack of literacy may be compensated to some extent if their partners are literate. Contraceptive use of such illiterate women (referred to as proximate literates in literature), may be higher than that of illiterate women whose partners too are illiterates (called isolate illiterates). This hypothesis is tested using the third wave of the Demographic Health Survey data for India (2005-2006). Current use of modern contraceptives was compared between these two groups for socio-economic and demographic correlates. This was followed by multivariate analysis, regressing current use of modern contraceptive methods on a dummy representing whether the partner was literate, along with relevant control variables. Results indicate that the proximate illiteracy effect was restricted to only specific groups and communities.

Keywords: Contraceptives, Demographic Health Survey data, Illiteracy, Reproductive health, India.

1. Introduction

At the micro-economic level, education generates returns not only to the person receiving education, but also to other persons (Sen, 1985; Walker & Unterhalter, 2007). A potentially important form of such externalities from education is the benefit derived by an illiterate person from a literate family member. Basu and Foster (1998) argue that an illiterate person's ability to transform various kinds of informational inputs into 'functionings' (Sen, 1985) is linked to the literacy status of the household to which the person belongs.[1] This implies that even though an illiterate person is poorly placed in the matter of availing himself of useful information, those illiterate person who have literate family members (referred to as 'proximate illiterate'), may be able to avail such information and attain a superior outcome compared to other illiterate persons whose family members are also not educated ('isolate illiterates'). Empirical studies reveal that such externalities from literacy may improve health and labour outcomes substantially (Basu et al, 2002; Gibson, 2001; see also Mishra, 2005). In this paper we test for the importance of

[1] Basu et al. (2000) identifies several contexts in which such intra-household externality may arise:

> "The government circulates an order intimating the availability of social assistance to physically handicapped people, widows and accident victims. Agricultural extension workers disseminate printed information on new technology relating to irrigation, and high-yielding crop varieties. Leaflets are distributed by a non-govern-mental voluntary agency advising rural people of their specific rights to information. The village moneylender doctors the statements of his borrowers' liabilities to his own advantage. The public health office puts out a simple printed bulletin on the advantages of oral rehydration." (pp. 35)

intra-household externality from literacy in a specific context – with regard to the adoption of modern family planning methods.[2]

Despite the importance emphasized on providing safe family planning methods in the International Conference on Population and Development (ICPD), held in Cairo in 1994, there still exists a high unmet need for modern contraceptives.[3] A recent study estimates that round 215 million women in the developing world as a whole have an unmet need for modern contraceptives (Singh et al., 2009). Unmet demand is particularly high in developing countries, and among women with low levels of education. For instance, Demographic Health Survey data for India (2005-06) reveals that 52 per cent of illiterate women do not use any contraceptive method, while about a third of illiterate fecund women not wanting a child do not use any contraceptive method. Given that such women are mainly from low income households and have limited access to health care services, they comprise a particularly vulnerable section of the community. Ensuring the reproductive health of illiterate female population requires massive investment of financial and administrative resources, given the size of this population.[4]

Further, there are socio-cultural barriers that have to be faced in developing countries when implementing programmes seeking to educate women, or in increasing their autonomy with respect to reproductive choices. The latter type of barriers primarily stem from the asymmetric nature of relationship between partners within the dyad making reproductive (in this case, contraceptive) choice. As researchers point out, though it is the women who implement decisions relating to adoption of contraceptives men often have a significant influence on wife's attitude towards using contraceptives (Chapagain, 2005; Gubhaju, 2009),[5] with educated males being more likely to encourage partners to use contraceptives (Grady, 1996; Wegner et al., 1998; Wilkinson, 1997). Results of a multivariate analysis, undertaken for Nepal using three waves of DHS data, shows that a male partner with primary education is 25 per cent more likely to allow his wife to adopt contraceptives than an illiterate male (Gubhaju,

[2] Family planning methods refer to methods used to attain the desired number of children and ensure the desired timing of conceptions and spacing between births. Such methods may be classified into three categories, depending upon their actual and theoretical reliability. *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 methods* consist of fertility preventing methods of proven effectiveness, like rhythm (or calendar) and withdrawal (*coitus interruptus*) methods. Although theoretically effective, the actual effectiveness of such methods depends upon the skill and knowledge of the users – so that they may not be very reliable in practice. *Modern contraceptive methods* include all hormonal methods (i.e., the pill, injectibles and implants), IUDs, male and female sterilization, condoms and modern vaginal methods (e.g., the diaphragm and spermicides).

[3] Unmet demand for (modern) contraceptives refer to women who want to avoid pregnancy but are not using a (modern) contraceptive method.

[4] Illiterate women aged 7 years and above in India number 193.48 million according to the 2001 Census estimates. Recently released provisional figures reveal that this figure has risen to 272.95 million in 2011.

[5] Not infrequently, opposition from the male partner has been found to thwart aspirations of the female to use family planning methods (Speizer et al., 2005). Such opposition may arise because of the apprehension that allowing women freedom to make reproductive decisions will: [a] erodes the authority of the male partner within the family, [b] encourage the wife to be unfaithful, or [c] loose face within the community. It is also pointed out that even if contraceptive use is approved in theory, it may be disapproved in practice (Blanc, 2001) – reflected in the refusal to use male condoms. In some instances, women have been documented to have made covert use of contraceptives; this exposes women to violence if found out by their male partners.

2009).[6] In view of the substantial evidence on male ascendancy over the female partner in contraception-related decisions, focusing on the male partner in family planning programmes may increase the probability of their success by arousing less opposition within the target group.

In this context the concept of proximate illiteracy (Basu and Foster, 1998) assumes significance as it implies that illiterate women are more likely to adopt modern contraceptive methods if they have access to a literate person in the household (particularly the husband, as choice of family planning method is determined within this dyad), thereby attaining outcomes superior to that of isolate illiterates. Thus, the 'proximate illiteracy hypothesis' is that modern contraceptive prevalence rates is higher among illiterate women who have literate partners, compared to illiterate women whose partners, too, are illiterate.

The paper is structured as follows. After describing the data source and methodology employed in this paper, we state the findings of the bivariate and multivariate analysis. This is followed by a discussion of the results. The concluding section brings out some points of interest for policy makers, and indicates some directions of further research.

2. Database and methodology

2.1 Data Source

The paper is based on unit level Demographic Health Survey (DHS) data collected in a national level survey from November 2005 to August 2006. This survey is the third in a series of national surveys.[7] It was 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. DHS (or National Family Health Survey, NFHS, as this database is also called in India) is 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. A nationally representative sample of 109,041 households, 124,385 women aged 15-49 years and 74,369 men aged 15-54 years – covering 99 per cent of the population in 29 states - were interviewed. The sample was drawn using a multi-stage stratified sampling method (IIPS & Macro International, 2006: 11-13).

The Individual file (IAIR51FL) is used for analysis. Out of the sample of 124,385 women, 39,769 illiterate women (constituting 32 per cent of the sample) were selected. Information on education level of partner is recoded to classify women as having either illiterate or literate partners. About 54 per cent of these women had literate partners; corresponding figure for rural and urban areas are 51 and 61 per cent, respectively. Predictably, this proportion is higher among those who resided in rural areas. This variable captures the impact of proximate illiteracy.[8]

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[6] A study for Vietnam (Dang, 1995) shows, in fact, that education of male partners is more important than that education of women with respect to adoption of family planning methods.

[7] Earlier DHS surveys were carried out in 1992-93 (NFHS-1) and 1998-99 (NFHS-2).

[8] Although proximate literacy normally considers whether any member of the family is literate or not, in the case of contraceptive use we consider only whether the partner is literate or not. The reason is that contraceptive use is

2.2 Sample Characteristics

Some important characteristics of the sample being analyzed are stated below:

1. Most of the respondents are from Central Indian states[9], followed by those from Northern and Eastern states. The proportion of proximate illiterates is highest in North (60%) and West (61%), and lowest in South (49%) and east (50%).
2. Hindu Other Backward Classes (OBCs) dominate the sample, followed by Scheduled Castes (SCs) in rural areas and by Muslims in urban areas. About 68 per cent of Hindu Forward Castes (HFCs), comprising 13 per cent of the sample, are proximate illiterates. This proportion is low among Hindu Scheduled Tribes (HSTs) (41%), Muslims (47%) and Others (50%).
3. The sample is more or less is uniformly distributed with respect to duration of marriage. Given that DHS samples women up to the age of 49 years only, the proportion of women married for more than 30 years is predictably low. Recently married (less than 4 years) women have a high proportion of literate partners (60%). About 53 per cent of women who have been married 10 years or more have literate partners.
4. Distribution of respondents by age groups is also uniform, though the representation of 14-19 year respondents is relatively low. Variation of the proportion of proximate illiterates across age groups is minimal.
5. The third wave of DHS in India estimates a wealth index score for respondents. This index is also used to classify respondents in five groups. Representation is highest in the lowest three groups in rural areas. In urban areas, economic status is relatively better, with a clustering in the top three groups. There is a strong positive relation between wealth index score and share of proximate illiterates. While 36 per cent of the respondents belonging to the poorest group are proximate illiterates, this figure is 81 per cent among the wealthiest group.
6. About 47 per cent of respondents residing in rural areas are engaged in economic activities; this proportion is 64 per cent in urban areas,. The proportion of proximate illiterates is higher among unemployed respondents (58%), compared to employed respondents (50%).
7. Partners of respondents are mainly engaged in primary activities (40 per cent) and as manual workers (42 per cent). In urban areas, manual labour (56 per cent) comprises the most common form of economic activity; in rural areas, partners are concentrated in primary activities (50 per cent). There is also an association between occupation of partner and share of proximate illiterates – 84 per cent of respondents

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essentially a private decision made by the partners. DHS data reveals that only 0.5 per cent cases does any one other than the respondent or her partner have any influence on the decision to use contraceptive use.

[9] States are divided into five geographical zones as below:

a) North Indian states – Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana, Uttaranchal, Delhi, Rajasthan, and Uttar Pradesh.
b) South Indian states – Andhra Pradesh, Karnataka, Kerala and Tamil Nadu.
c) East Indian states- Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Assam, West Bengal, and Orissa.
d) West Indian states- Gujarat, Maharashtra and Goa.
e) Central Indian states- Bihar, Jharkhand, Chhattisgarh and Madhya Pradesh.

whose partners are engaged in white collar jobs are proximate illiterates, while this proportion is 48 and 52 per cent for primary workers and manual workers, respectively.

2.3 Methodology

The study employs both bivariate and multivariate methods. In the next section, we undertake a bivariate analysis of the impact of proximate illiteracy across the socio-economic determinants of modern contraceptive use using t-tests.[10] This is followed by a multivariate analysis in which the decision to use modern contraceptives is regressed on proximate illiteracy. The socio-economic correlates on which bivariate analysis was undertaken are used as control variables. Since the dependent variable is binary (the respondent either uses a modern contraceptive, or does not), the appropriate regression model is logit model. This model is initially estimated for the all-India sample (Total, Rural and Urban). Now the impact of proximate illiteracy on contraceptive use is conditioned by socio-cultural factors, which cannot be observed. The exclusion of unobserved variables may lead to the omitted variable bias, creating a spurious relationship in the aggregate sample. Therefore, Iverson and Palmer-Jones (2008) argues, disaggregate-level analysis should be carried out for groups defined in terms of correlates like socio-religious identity, geographical zones, etc. Accordingly, the regression analysis is undertaken for sub-samples formed on the basis of socio-religious identity, geographical zones, wealth index, occupational category of respondents, employment status of respondent, and gender of last living child.

3. Findings

3.1 Bivariate analysis

Tables 1-3 present the results of the bivariate analysis for the impact of being a proximate illiterate compared to being an isolate illiterate on contraceptive use. Modern contraceptive prevalence rates (CPR) among proximate and isolate illiterates are stated in columns 3 and 4 of each table for different correlates, while the difference in CPR between proximate and isolate illiterates is given in column 5. A large value of the difference indicates that being a proximate illiterate gives one a substantial advantage with respect to family planning and control. The t-test statistic, indicating whether the differences are statistically significant, is also stated.

Table 1: Results of bivariate analysis for demographic variables

Correlate	Groups	Partner's education		Difference	t-statistic
		Literate	Illiterate		

[10] DHS surveys distinguishes between four types of respondents with respect to contraceptive use: non-users (46.54 per cent), using folkloric methods (0.50 per cent), using traditional methods (5.80 per cent) and modern methods like condoms, intra-uterine devices, oral pills, sterilization, etc (47.16 per cent). Folkloric methods consist of locally described or spiritual methods believed popularly to reduce fertility, but of unproven effectiveness, like herbs, amulets, gris-gris, etc. Traditional methods consist of fertility preventing methods of proven effectiveness, like rhythm (or calendar) and withdrawal (*coitus interruptus*) methods. Modern contraceptive methods include all hormonal methods (i.e., the pill, injectibles and implants), IUDs, male and female sterilization, condoms and modern vaginal methods (e.g., the diaphragm and spermicides). Since only modern methods are reliable, we have clubbed together the former three categories, viz. non-use, using folkloric methods and using traditional methods, into one group. Although the clubbing of traditional methods with non-use may be questioned on the grounds that traditional methods are effective and can theoretically be used reliably (Basu, 2005), the *de facto* effectiveness of traditional methods requires considerable skill, knowledge of physical processes and a high degree of inter-spousal communication. Illiterates, comprising the focus group in this analysis, are therefore unlikely to be able to use rhythm and withdrawal reliably.

Geographical zone	North	54.67	50.21	4.46	3.6948***
	Central	38.82	32.64	6.18	7.0803***
	East	39.09	36.11	2.98	2.5874**
	West	65.21	63.07	2.14	1.1759
	South	69.86	70.68	-0.81	-0.5020
Type of place of residence	Urban	55.95	51.28	4.67	4.4101***
	Rural	46.10	42.93	3.17	5.0281***
Age in 5-year groups	15-19	4.70	4.22	0.48	0.4878
	20-24	22.12	18.82	3.29	2.7430**
	25-29	44.02	40.22	3.80	2.9750***
	30-34	58.92	53.38	5.54	4.6388***
	35-39	62.68	57.17	5.51	4.4977***
	40-44	60.13	54.39	5.75	4.1573***
	45-49	59.72	52.16	7.56	4.8383***
Marital duration 5-year groups [excludes: married *gauna* not performed]	0-4	8.45	5.54	2.91	3.2746***
	5-9	31.05	25.69	5.36	4.3504***
	10-14	51.87	45.35	6.52	5.0257***
	15-19	60.91	57.44	3.47	2.7966**
	20-24	63.83	56.53	7.30	5.7163***
	25-29	61.29	55.05	6.25	4.3351***
	30+	62.00	52.99	9.00	4.4557***
Gender of last child	No child	2.09	1.30	0.79	1.4204
	Male	55.00	49.51	5.49	6.5916***
	Female	48.13	43.80	4.33	4.9879***

*Note: ***, ** and * denotes significance at 1%, 5% and 10% level, respectively.*

Table 1 presents results of bivariate analysis for demographic variables. Important findings are:

a) Analysis of contraceptive use by geographical zones reveals that CPR is highest among respondents living in southern states of India (about 70 per cent), followed by western regions (above 60 per cent). This may be attributed to the high empowerment levels of South Indian women (Dyson and Moore, 1983). The proximate illiteracy effect, on the other hand, is highest among respondents living in Central (6.18 percentage points), North (4.46 percentage points) and East (2.98 percentage points) India. This may be possibly because lower levels of empowerment constrain women from accessing information about family control methods, so that they become dependent on their husbands for such information. Differences in CPR levels are insignificant at 10% level for South and West.

b) Place of residence also affects CPR, with urban residents having higher CPRs than their rural counterparts. While this is obviously because of the availability of information and access of methods, it is less easy to explain why proximate illiteracy has a larger effect among urban women. One possibility may be that even if a proximate illiterate obtains information about family reproductive methods, she may not be able to access them readily in rural areas.

c) Studies report that CPR levels are strongly related with age, though not linearly (Reddy, 1984). In our sample, too, as older respondents are considered CPR rises initially. After crossing 40 years, women loose their reproductive ability so that contraceptive use becomes redundant. Beyond this level, therefore, CPR levels falls. Now Iverson and Palmer-Jones (2008) had argued that the effect of proximate illiteracy will become stronger for older respondents or over duration of marriage as time eases communication flows between partners. While the magnitude of difference in CPR levels between proximates and isolates is statistically insignificant (except for 15-19 years age group) and increases with age (and also to a less clear extent with duration of marriage), this result should be treated with caution as contraceptive demand is guided by biological processes.

d) Given the strong son preference manifested in South Asian countries and also observed in India (Arnold, 2001; Jayaraman et al. 2009), gender of the last child may conceived to be an important influence on the strength of proximate illiteracy. While there is no variation in CPR use among childless respondents with literate or illiterate partners (t-statistic is insignificant at 10% level), education of partner does have a substantial effect on CPR for respondents with at least one living child. Moreover, externalities of education are higher if the last child is a male (5.49 percentage points), than if the child is a female (4.33 percentage points). This is consistent with the son preference hypothesis.

Table 2: Results of bivariate analysis for socio-cultural variables

Correlate	Group	Partner's Education		Difference	t-statistic
		Literate	Illiterate		
Socio Religious Identity	Muslim	37.39	32.20	5.19	4.0969***
	H-SC	50.67	48.46	2.21	1.8370**
	H-ST	46.02	44.05	1.97	1.1926
	H-OBC	51.26	50.59	0.67	0.6791
	H-FC	58.32	56.64	1.68	1.0679
	Others	41.43	34.41	7.01	3.8392***
Frequency of viewing TV	Not at all	40.72	37.61	3.10	4.1835***
	Less than once a week	44.34	45.56	-1.23	-0.8105
	At least once a week	53.11	55.64	-2.54	-1.6021
	Almost every	62.02	63.07	-1.05	-0.9219

	day				

*Note: ***, ** and * denotes significance at 1%, 5% and 10% level, respectively.*

Researchers have reported that contraceptive uses are low within the Muslim community, though the explanation for this observation has varied (Alagarajan & Kulkarni, 2008; James & Nair, 2005). On the other, advantaged communities (HFCs) have higher CPRs. While we observe a similar finding (Table 2), interestingly, the impact of proximate illiteracy works in an opposite direction – its impact is relatively stronger among Muslims (5.19 percentage points), other religious minorities (7.01 percentage points) and other disadvantaged groups (like HSC, 2.21 percentage points), compared to among HFCs (1.68 percentage points). Difference in CPR levels is significant at 1% level among Muslims and Others and at 10% level among HSCs.

Public media (television) has a strong influence on CPR, and can be an important substitute for education of respondent or her partner. It is observed from Table 2 that proximate illiteracy effect is higher for respondents who do not watch TV (5.34 percentage points; t-statistic is also statistically significant at 1% level). On the other hand, this effect is only 0.78 percentage points for respondents who watch TV frequently. This may reflect the fact that even isolate illiterates are getting necessary information about family planning methods – which their illiterate partner is unable to provide - from the public media.

Table 3: Results of bivariate analysis for economic variables

Correlate	Group	Partner's Education		Difference	t-statistic
		Literate	Illiterate		
Wealth index	Poorest	35.54	34.43	1.11	1.0559
	Poorer	43.15	44.14	-0.99	-0.9188
	Middle	49.03	53.24	-4.22	-3.7558***
	Richer	57.85	59.54	-1.69	-1.2285
	Richest	65.84	60.00	5.84	2.4060**
Recode of partners occupation	Agriculture	49.01	46.75	2.26	2.6352**
	White collar jobs	55.37	49.20	6.17	1.799*
	Sales	48.89	45.02	3.86	2.0074**
	Services	54.74	53.80	0.94	0.3582
	Manual labour	47.29	42.02	5.27	6.3357***
Recode of respondent	Not Employed	45.49	37.76	7.73	9.8057***

occupation	Employed	52.92	50.10	2.82	3.7979***

*Note: ***, ** and * denotes significance at 1%, 5% and 10% level, respectively.*

The results of the bivariate analysis for economic variables are presented in Table 3. Analysis of CPR use by wealth index reveals that the proximate illiteracy effect is positive for the richest (5.84 percentage points) and poorest group (1.11 percentage points). Surprisingly, a negative effect of proximate illiteracy is observed among the rest of three wealth index groups. However, the difference in CPR levels is significant at 5% level only for two groups (middle and richest).

Table 3 also shows that the proximate illiteracy effect is highest for those respondents having partners involved in white collar job (6.17 percentage points), followed by respondents whose husbands work as manual labourers (5.27 percentage points). The differences are statistically significant, except for respondents with partners working in service sector.

Employment status of the respondent is found to be an important correlate of CPR and proximate illiteracy effect. It may be seen that CPR is higher among employed respondents (because of the opportunity costs of conceiving), while the positive effect of having a literate partner is stronger among the unemployed (7.73 percentage points). This may be explained in terms of lack of networks and outside contacts (who may substitute for partners) of unemployed respondents.

3.2 Multivariate Analysis

Our research hypothesis is that CPR is higher among proximate illiterates, compared to CPR among isolate illiterates. To test this hypothesis we regress current contraceptive use on a dummy indicating whether the respondent's partner is literate (PLEFFECT). We also include several control variables, capturing the economic status of the respondent, her demographic profile, her socio-cultural background and the institutional context. Control variables used are as follows:

1. *Demographic*: Geographical zone, Place of residence of the respondent, Age and square of age of the respondent, Marital duration, Number of living sons or daughters and Gender of last child.
2. *Socio-Cultural*: Socio religious identity, and Frequency of watching TV.
3. *Economic*: Employment status of the respondent, Occupation of the partner, and Wealth index score.
4. *Institutional*: Place of last delivery.

Now the dependent variable (current contraceptive use) is a binary variable taking the value 1 if the respondent uses modern contraceptive methods and takes the value 0 if the respondent does not use any contraceptives at all, or uses either traditional or folkloric methods of contraceptive. In this situation, we have a choice between logit and probit

models. As the qualitative results do not vary between these models, we have used a logit model, whose results are presented in Table 4.

Table 4: Results of Logit Model for All India – Total, Rural & Urban

Variables	All India - Total		All India – Rural		All India - Urban	
	Odd ratio	z	Odd ratio	z	Odd ratio	z
Isolate (RC)	1		1		1	
PLEFFECT	1.08	2.48**	1.08	2.32**	1.07	1.27
Central (RC)	1		1		1	
North	1.8	14.81***	2.14	15.84***	1.25	3.02***
East	1.18	4.09***	1.35	6.31***	0.88	-1.69*
West	2.73	18.55***	3.19	17.26***	1.99	7.42***
South	3.66	23.83***	3.79	19.53***	3.31	12.8***
Urban (RC)	1					
Rural	0.96	-1.05				
Age of respondents	1.51	26.31***	1.54	23.31***	1.42	11.85***
Square of age of respondents	0.99	-28.15***	0.99	-24.66***	0.99	-13.31***
Duration of marriage	1.34	13.22***	1.34	11.22***	1.36	7.42***
No. of living sons	1.2	13.71***	1.19	10.62***	1.25	8.58***
No. of living girls	0.86	-12.23***	0.84	-12.41***	0.92	-3.39***
Male child (RC)	1		1		1	
No child	0.03	-19.90***	0.04	-16.86***	0.2	-10.38***
Female child	0.98	-0.58	0.96	-1.12	1.04	0.7
Hindu OBC (RC)	1		1		1	
Muslim	0.53	-13.90***	0.45	-13.64***	0.63	-6.03***
Hindu Scheduled Caste	1.03	0.71	1.02	0.42	1.04	0.53
Hindu Scheduled Tribe	1.06	1.12	1.02	0.28	1.08	0.57
Hindu Forward class	1.07	1.42	1.1	1.76*	1.01	0.15
Other Socio Religious Groups	0.59	-9.29***	0.54	-9.43***	0.73	-2.44**

Variables	All India - Total		All India – Rural		All India - Urban	
	Odd ratio	z	Odd ratio	z	Odd ratio	z
Does not watch TV (RC)	1		1		1	
Watches TV occasionally	1.21	4.43***	1.21	3.94***	1.19	1.98*
Watches TV at least once a week	1.63	10.65***	1.62	8.63***	1.69	6.26***
Watches TV frequently	1.81	14.06***	1.7	9.69***	1.99	9.75***
Respondent is unemployed (RC)	1		1		1	
Respondent is employed	1.37	10.59***	1.33	8.05***	1.52	7.23***
Partner works as labourer (RC)	1		1		1	
Partner is in agriculture	1.06	1.76*	1.08	2.19**	0.83	-2.07**
Partner is in sales sector	1.04	0.71	1.01	0.15	1.06	0.83
Partner does white collar job	0.98	-0.31	0.95	-0.58	1.04	0.4
Partner is in service sector	1.02	0.3	1.01	0.13	1.04	0.42
Wealth index	1.19	11.14***	1.17	8.19***	1.21	6.77***
Birth at home (RC)	1		1		1	
Institutional delivery	0.82	-3.94***	0.74	-4.63***	0.92	-1.02
Model Statistics						
Number of observations	28373		20586		7787	
LR χ^2	8196.78***		6017.14***		2074.48***	
Pseudo R^2	0.21		0.22		0.19	

*Note: ***, ** and * denote significance at 1%, 5% and 10% level, respectively. RC denotes reference category for categorical variables.*

The value of χ^2 is greater than the tabulated value in all instances, indicating that the null hypothesis (all elements of the coefficient vector are equal to zero) is rejected at 1% level. The goodness of fit (given by the McFadden pseudo R^2) varies between 0.19 (Urban) to 0.22 (Rural). This is quite satisfactory.[11]

The positive impact of having a literate partner on the probability of using contraceptives is given by the sign of the coefficient of proximate illiteracy (PLEFFECT). Since we have reported odd ratios in Table 4, a positive coefficient will result in an odd ratio greater than unity, while a negative coefficient will yield an odd ratio less than unity. It can be seen that the value of the odd ratio is greater than unity and is statistically significant at 1% level for both the Total and Rural sample. This indicates that proximate illiterates are more likely to use contraceptives than isolate illiterates.

In urban areas, however, PLEFFECT is not significant even at 10% level. A possible reason why the impact of proximate illiteracy is not significant in urban areas is that illiterate women with illiterate partners are not really "isolates" – they have access to information through networks created during employment, greater access to public media, and other sources of information (Madhavan et al., 2003).

On the other hand, rural illiterate women are comparatively less exposed to social networks like public media, employment etc. and hence partner's education, acts as an important medium to convey information about contraceptives, significantly affecting respondents contraceptive choice. Hence PLEFFECT is found to be significant in case of all India and rural sample.

Most of the demographic control variables are statistically significant. Respondents living in North, East, West and South India are significantly more likely to use modern contraceptives than respondents from Central India. While this is also true in Rural India, in urban areas, women from East India are less likely to use contraceptives than Central Indian women. Moreover, comparison of the odd ratio across regions reveals that Southern women, followed by Western women, are more likely to adopt modern contraceptives, other things remaining constant. Prevalence of CPR among rural respondents is not statistically different from that in urban areas.

Odd ratio of age of respondents is statistically significant at 1% level and greater than unity, indicating a positive relationship between age and contraceptive use. However, as demand for contraceptive is linked to biological processes, with its need getting reduced as the women becomes older,[12] the relationship is expected to be non-linear.

[11] While this value is not very high, we should note that the pseudo-R^2 measure provides only an approximation, and is of limited value. Secondly, cross section samples contain a great deal of unobserved heterogeneity. Since it is not possible to capture this heterogeneity in the regression model, the explanatory power of even models estimated using OLS methods are often quite low. Hence, the values of pseudo R^2 obtained in the three models are quite satisfactory.

[12] Two processes are important in reducing demand for contraceptives among older women - sexual activity will decline, and her reproductive period will terminate (menopause) (Dutta and Husain, 2011).

The coefficient of the square of age is expectedly negative and significant at 1% level. Similar to age, contraceptive use and duration of marriage is found to be positively related.

Number of living sons and daughters are found to be statistically significant at 1% level. However, their signs differ. While the odd ratios of number of living sons is greater than unity, that of living daughters is less than unity. Respondents whose last child was a female child are also found to be less likely to use modern contraceptives than women whose last birth is male, though coefficients are not statistically significant.[13] Predictably, childless respondents have OR less than unity which are all significant at 1% level.

CPR does not vary significantly between different social groups (Forward Castes, Scheduled Castes, Scheduled Tribes and Other Backward Castes) within the Hindu community. However, religious minorities (both Muslims and non-Muslims) have a lower CPR. This may be observed for rural and urban areas.[14]

Public media is found to be an important substitute for partner's education. Respondents who watch TV occasionally, about once a week, or more frequently are more likely to adopt contraceptives. Two important observations are: firstly, the odd ratios increase with an increase in frequency of watching TV; secondly, odd ratios are higher in urban areas, relative to rural areas.

Economic status of the respondent also determines probability of adopting contraceptives. If the respondent is employed she is significantly more likely to adopt contraceptives. While this is true for both rural and urban residents, the OR is higher for urban residents (OR=1.33 and 1.52 for rural and urban respondents, respectively).

Contraceptive use does not vary significantly (at 10% level) between women whose partners are manual labourers (forming the reference category), engaged in sales activities, work in white collar jobs or in service sector. The residual occupational group (whose partner is engaged in agricultural activities) has significantly different CPRs than the reference category.

The wealth index score provided in the DHS dataset is positively related to contraceptive use. While the odd ratios are significant at 1% level in both rural and urban residents, the value of the odd ratios differ marginally (Rural=1.17, Urban=1.21).

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[13] This results is somewhat surprising in view of the benefits of having sons, vis-à-vis daughters, identified in the literature on family economics – having sons enable parents to retain property (particularly land) within the same lineage, obtain inter-generational insurance for their old age, ensure that their last rites are performed, etc. Empirical literature also (cited earlier Section 3.1) provides strong evidence of son preference. On the other hand, parents (mainly from the Hindu community) are also found to desire at least one girl because of social duty like *kanya dan* (selflessly giving away a daughter in marriage) (Arnold 2001; Dutta & Husain, 2011).

[14] In rural areas, coefficient of HFC is significant at 10% level.

The final variable, dummy for place of birth, reveal that women whose last birth was in a public or private health facility are less likely to use contraceptives. In urban areas, this variable is not significant at 10% level.

3.3 Analysis at disaggregate level

The sample characteristics and bivariate analysis indicate that there may be an association between the proportion of proximate illiterates and contraceptive use for some control groups. For instance, Muslims have both a lower share of proximate illiterates and lower level of CPR. This indicates the possible presence of an unobserved variable that may be creating a spurious relationship for the aggregate sample. To eliminate the effect of this omitted variable, we divide the sample of illiterate women by several criteria, and tested for the presence of proximate illiteracy for each of the sub-samples. The alternative criteria used are: geographical zone, socio-religious groups, employment status of respondent, partner's occupation, wealth index[15] and gender of last child. Although we have regressed current contraceptive use on all remaining control variables used earlier, we state only the coefficient and t-statistic of PLEFFECT and the model statistics for the sake of brevity in Table 5.

Table 5: Results of Logit Model by Selected Groups – All India level

Groups	Variable	Odd ratio	z	N	Pseudo R^2	χ^2
Zone	North	1.12	1.82*	6192	0.21	1828.99
	South	1.11	1.03	2958	0.27	993.41
	East	0.99	-0.13	6280	0.13	1079.93
	West	1.35	2.77**	2507	0.27	885.54
	Central	1.15	2.76**	10436	0.78	2452.87
SRC	Muslim	0.97	-0.43	4793	0.15	933.64
	Hindu Scheduled Caste	1.10	1.49	5722	0.23	1802.77
	Hindu Scheduled Tribe	1.10	1.02	3116	0.22	919.50
	Hindu Forward class	1.00	-0.02	3835	0.20	1030.25
	Other Socio Religious Groups	1.32	2.56**	2422	0.24	768.18
	Hindu Other Backward Classes	1.18	3.06***	8485	0.23	2754.72
Marital duration	0-4 years	1.28	1.55	3362	0.16	272.13
	5-9 years	1.2	2.42**	5008	0.19	1146.92
	10-14 years	1.09	1.21	4680	0.14	921.64

[15] The variable v190 was used. This classes respondents into five percentile groups based on the wealth index score (v191).

Groups	Variable	Odd ratio	z	N	Pseudo R^2	χ^2
	15-19 years	0.9	-1.52	4820	0.12	784.81
	20-24 years	1.14	1.85**	4661	0.14	863.33
	25-29 years	1.1	1.20	3714	0.13	671.86
	30+ years	1.24	1.96*	1860	0.13	324.01
Wealth Index	Poorest	1.14	2.22*	7561	0.17	1647.28
	Poorer	1.15	2.35**	6882	0.22	2068.08
	Middle	0.96	-0.71	6724	0.21	1924.3
	Richer	0.99	-0.18	5100	0.19	1296.81
	Richest	1.45	2.89***	2106	0.17	463.77
Employment status of respondents	Employed	1.06	1.53	14685	0.21	4242.88
	Unemployed	1.11	2.38**	13688	0.21	3829.03
Partner's occupation	Partner is in agriculture	1.06	1.23	10954	0.21	3094.13
	Partner is in sales sector	1.02	0.16	2548	0.19	659.65
	Partner does white collar job	1.00	-0.03	1303	0.17	303.07
	Partner is in service sector	0.85	-1.13	1469	0.24	478.09
	Partner works as labourer	1.16	3.23***	12099	0.23	3729.68
Gender of last child	No child	1.50	1.09	2140	0.08	29.71
	Female child	1.09	2.07**	12514	0.17	2920.31
	Male child	1.06	1.36	13719	0.16	3002.45

*Note: ***, ** and * denote significance at 1%, 5% and 10% level, respectively.*

Important results are as follows:

a) *Geographical zones*: Researchers have argued that claims that there exists a spatial contiguity in fertility transition in India and birth control progression in India follows a geographical trend irrespective of socio economic and religious differentials. For instance, James and Nair's analysis of NFHS2 data for 1998-99 revealed that CPR is low among northern, central and western states in India (James and Nair, 2005). A similar result is obtained in this study. Interestingly, the impact of proximate illiteracy is also significant in these geographical states (Table 5). One explanation may be

in terms of access to kinship relations that have been reported to encourage contraceptive use (Godley, 2001). The prevalence of exogamy in Central and Northern states curtail access to kinship (Dyson and Moore, 1983), which may restrict communication with matrimonial relatives and make women more dependent on partners for reproductive knowledge.

b) *Socio-religious groups*: While bivariate analysis reveals that the strength of proximate illiteracy is high among Muslims – as well as among non-Muslim minorities – this effect appears insignificant in the disaggregative analysis (Table 4 and 5). This would appear to be the effect of cultural restrictions lowering the status of women within Muslim community, and the reluctance of Muslim males to communicate with their partners (Maddox, 2007). In fact, it is only among HOBCs and non-Muslim minorities (All Others) that the benefits of literacy are transmitted across partners. The coefficient of PLEFFECT is insignificant at the 10% level for all other SRCs.

c) *Employment status*: The impact of proximate illiteracy is also found to be significant among unemployed women. This may be explained in terms of their dependence for reproductive knowledge on their partners. In comparison, employed women are generally more mobile, have greater access to networks and are able to both obtain and share knowledge of family planning methods from sources other than their partners.

d) *Wealth Index*: While income and CPR is observed to be positively related in keeping with existing studies (Schoenmaker, 2005), Table 6 shows that the coefficient of PLEFFECT is significant only for the two poorest and richest wealth index groups. This may indicate the lack of alternative sources of knowledge of respondents from poor households, or the greater willingness of their partners to share reproductive knowledge (as opportunity costs of conception – as proportion of total household income - may be relatively higher among poorer households).

e) Partner's Occupation: PLEFFECT is significant only in the case of respondents whose partners are manual labourers.

f) *Gender of last child*: As mentioned previously, the desire for children, particularly sons, is an important factor motivating reproductive behavior in South Asian countries. The extent to which this desire is satisfied can determine the level of inter-spousal communication on family planning methods. Our analysis reveals that it is only among families whose last child is a daughter that such communication occurs to a significant extent.

One problem with using the merged rural and urban sample relates to the difficulties inherent in defining literacy, particularly in urban areas. Hence, the robustness of the above results should be checked by repeating the above exercise for the rural sample.[16] This analysis reveals almost similar results (Table 6). The only differences are with respect to the wealth index sub-samples – in Table 5 we found PLEFFECT to be significant among the poorest two

[16] We have not presented the results for urban sub- samples as PLEFFECT was not significant in the urban sample. Estimated models show that PLEFFECT is significant for the majority of groups.

and richest sub-samples, while in the case of Rural sub-sample, PLEFFECT is significant only for the respondents belonging to the 'Poorest' category.

Table 6: Results of Logit Model for Rural India by Selected Groups

Groups	Variable	Odd ratio	z	N	Pseudo R^2	χ^2
Geographical Zone	North	1.13	1.63	4496	0.24	1478.35
	South	1.02	0.18	1700	0.18	355.02
	East	1.04	0.52	4767	0.14	896.42
	West	1.49	2.88***	1598	0.29	614.55
	Central	1.14	2.24**	7888	0.17	1634.81
Socio religious community	Muslim	1.02	0.22	2777	0.14	449.55
	Hindu Scheduled Caste	1.07	0.86	3979	0.23	1269.41
	Hindu Scheduled Tribe	1.12	1.16	2780	0.21	797.69
	Hindu Forward class	0.93	-0.66	2525	0.20	711.74
	Other Socio Religious Groups	1.30	2.21**	2027	0.25	654.32
	Hindu Other Backward Classes	1.20	2.86***	6498	0.23	2038.25
Marital duration	0-4 years	1.47	1.97*	2569	0.14	170.44
	5-9 years	1.28	2.69**	3731	0.21	879.40
	10-14 years	1.16	1.75*	3408	0.16	739.30
	15-19 years	0.91	-1.15	3462	0.12	573.00
	20-24 years	1.04	0.46	3264	0.15	675.71
	25-29 years	1.12	1.23	2663	0.13	487.99
	30+ years	1.09	0.67	1302	0.12	221.25
Wealth Index	Poorest	1.16	2.47**	7109	0.17	1564.89
	Poorer	1.11	1.60	5904	0.22	1785.83
	Middle	0.97	-0.41	4744	0.23	1484.44
	Richer	1.05	0.45	2267	0.22	670.16
	Richest	1.33	1.06	562	0.16	121.11
Employment status of respondents	Employed	1.06	1.36	11965	0.21	3502.19
	Unemployed	1.14	2.29**	8621	0.21	2394.61

Groups	Variable	Odd ratio	z	N	Pseudo R^2	χ^2
Partner's occupation	Partner is in agriculture	1.02	0.10	1261	0.19	321.48
	Partner is in sales sector	0.93	-0.27	746	0.21	213.07
	Partner does white collar job	0.88	-0.63	715	0.20	197.91
	Partner is in service sector	1.20	3.09***	7675	0.23	2339.85
	Partner works as labourer	1.06	1.18	10129	0.21	2896.32
Gender of last child	No child	1.40	0.79	1471	0.10	29.77
	Female child	1.10	1.90*	9022	0.18	2151.73
	Male child	1.06	1.27	9901	0.16	2243.89

*Note: ***, ** and * denote significance at 1%, 5% and 10% level, respectively.*

3.4 Extensions

There may be several reasons why the positive externality of literacy is absent. One reason, of course, may be that literacy is too low an education level for the male member of the dyad to have sufficient edge over his illiterate partner. Given that illiteracy denotes merely the ability to read and write, and does not incorporate any concept of comprehension, a literate person may not be able to develop the ability to comprehend knowledge about family planning methods and its importance to a level sufficient for him to transmit it to his partner. In this context, the existence of a substantial literature pointing out that the male partner may not have knowledge about issues relating to reproductive health may be noted (Char et al, 2009; Mahmood, 1997). For instance, Char et al.'s study of men in Madhya Pradesh noted that "men conceptualize family planning in ways different from the government family planning promotion campaigns" (Char et al., 2009: 136) and that their knowledge of temporary contraceptive methods was limited to knowledge of their names. This implies that a 'literate' partner may not have adequate information to share.

This has an important methodological implication. Instead of taking a dummy for literacy we can experiment with higher levels of education to find out if – and at what level – education generates externalities for the illiterate partner. This is undertaken in this section. Given the frequency distribution of partners, we consider only two levels

– partner has at least primary education (PPEFFECT) and partner has secondary education (PSEEFECT).[17] The analysis undertaken earlier is repeated, replacing the PLEFFECT dummy with these dummies. The results are summarized in Table 7 below.

Table 7: Comparison of effects of different levels of proximate education on contraceptive use of partner

Group	Model 1: Partner is literate	Model 1: Partner has primary education	Model 3: Partner ahs secondary education
All India	Total (1.0762); Rural (1.0847)	None	None
Geographical zone	North (1.1244); Central (1.1482); West (1.3549)	**North (1.1292);** East (0.7913); **West (1.2759)**	East (0.6230)
Socio-religious groups	HOBC (1.1838); OSRC (1.3152)	None	HFC (0.6085); **OSRC (2.1355)**
Employment status	Unemployed (1.1099)	None	None
Wealth index	First quintile (1.1384); Second quintile (1.1485); Fifth quintile (1.4537)	Fourth quintile (0.8833)	**First quintile (1.8530); Second quintile (1.5611);** Fourth quintile (0.6731)
No. of living sons	Two sons (1.1195)	None	Two sons (0.7408)
No. of living daughters	None	None	None
Gender of last child	Female (1.0943)	**No child (2.2389)**	**No child (6.6704)**
Marital duration	5-9 years (1.2028); 20-24 years (1.1382); 30 years & above (1.2402)	**0-4 years (1.2899)**	None

Note: Only groups with dummies (for partner's education) significant at 10% level have been identified. Figures in parentheses are Odd ratios.

While the coefficient of PLEFFECT is statistically significant among 16 groups (including India-Total and India-Rural), coefficients of PPEFFECT and PSEFFECT are significant among six and eight groups, respectively. Moreover, even among these groups, a positive coefficient[18] for PPEFFECT and PSEEFECT is observed only within four cases for both dummies, respectively (marked in bold). Comparing odd ratios, we find that odd ratios of

[17] Only 1.87 per cent of sample women have husbands with at least higher secondary education (corresponding to 12 years of schooling). Primary and secondary education levels correspond to 5 and 10 years of schooling, respectively.
[18] A negative coefficient (odd ratio less than unity) implies that, instead of generating positive externalities, we have negative externalities, with the educated partner thwarting reproductive choice of the woman.

gender of last child is higher for both PPEFFECT and PSEFFECT,[19] odd ratio of marital duration (for groups married for 0-4 years) is higher for PPEFFECT, and odd ratios for wealth index score is higher for PSEFFECT (first and second quintiles) – compared to corresponding odd ratios for PLEFFECT. In all other cases, odd ratios of PLEFFECT are higher than that of PPEFFECT and PSEFFECT. This indicates that literacy, rather than higher levels of education, generates substantial externalities with respect to decision to use modern contraceptives.

4. Conclusion

To sum up, this study finds some evidence of transmission of information (Basu-Foster proximate illiteracy effect) related to family planning methods from a literate person to his illiterate partner. This is very important, given the asymmetry between partners with respect to reproductive decisions and the tendency of men to act as "gate keepers" of family welfare (Char et al., 2009). However, such transmission is not across the board, but is observed to occur significantly only among specific cases and among specific communities.

Another major finding is that such transmission tapers down as we increase the level of education of the male partner. This is very important for policy design, as it implies that even a small level of investment in education generates substantial externalities in the sphere of reproductive health. It also implies that a strategic option before policy makers in developing South Asian countries is to refocus family planning programmes away from women to men, seeking to re-educate them about benefits of contraceptives and provide them information about alternative methods through inter-personal communication with health workers.

Given the evidence in favour of the proximate illiteracy effect observed among specific sub-groups, a natural question that may arise is why such externality does not arise among all communities/sub-groups. An important reason for the failure to find evidence of any significant flow of information between partners except *in specific cases and among communities* may lie in barriers to such transmission. For instance, Maddox (2007) points out that even if the literate partner possesses information, he may not be willing to share this information. The case of the literate Iqbal, who is unwilling to share the benefits of his literacy with his illiterate wife, may be noted. A possible reason for the refusal may be socio-cultural barriers, which discourage communication with wives. Such barriers may be found in, for instance, Muslim communities where the status of women is exceptionally inferior. Partners may also be reluctant to share information as the knowledge may empower women and increase her bargaining power within the family. The strong son preference, coupled with the fact that it is the women who bears the cost of conception, also may encourage men to withhold information related to contraceptives.

We should also not overlook the presence of alternative sources of information, other than the partner, about reproductive issues. The presence of such substitute sources of information, too, is community or group specific. As pointed out by Godley (2001) and Madhavan et al. (2003) access to networks and contacts with kins may reduce

[19] This possibly indicates that education counteracts the strong son preference prevalent among the barely literate population.

dependence of an illiterate woman on her partner. Government policies like *Swarna Jayanti Sahari Swarojgar Yojana* (Golden Jubilee Urban Self-employment Scheme) and *Swarna Jayanti Grameen Swarojgar Yojana* (Golden Jubilee Rural Self-employment Scheme) seeking to empower women through formation of Self Help Groups may also serve as alternative transmitters of reproductive knowledge. Convergence between such employment generation programmes and family planning programmes can augment such information flows.

Another important substitute source of information is the public media, particularly television. Table 3 shows that women who watch television infrequently are 21 per cent more likely to use contraceptives than those without access to television; this percentage goes up to 63 and 81 for those who watch television at least once a week and frequently, respectively. Results for logit model of contraceptive use on PLEFFECT and other control variables also reveals that the coefficient of PLEFFECT is statistically significant for only the sample of women without access to television – among women who watch television, even if infrequently, PLEFFECT is insignificant. This is in line with works noting the positive effect of public media on contraceptive use (Agha, 2002) – with even soap entertainments programmes being found to exert a strong influence (Vaugan et al., 2000). NFHS reports also observe that television is an important source of information about family planning. This calls for greater reliance on public media in spreading messages about family planning among less educated families.

However, such information can only sensitize the viewer about the need to adopt the contraceptives. The objective of the policy makers should not be merely to encourage women to use contraceptives, but to ensure more informed decision-making. This calls for providing information about the alternative contraceptive methods available, their economic costs, their side effects, etc. Anecdotal evidence from medical practitioners reveal that the thrust to encourage sterilization often leads to undesirable side effects as patients are not informed about side effects of this method. This calls for supplementing the media based campaign with greater face to face interaction between target women, and health workers (like Accredited Social Health Activist, etc.).

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REFERENCES

Agha, S., Rossem, R. V. (2002). Impact of Mass Media Campaigns on Intentions to Use The Female Condom in Tanzania. *International Family Planning Perspectives*, 28(3), 151-158.

Alagarajan, M., Kulkarni, P. M. (2008). Religious Differentials in Fertility in India: Is There Convergence? *Economic and Political Weekly*, 43(48), 44-53.

Arnold, F. (2001). Son Preference in South Asia. In: Z.A. Sathar and J.F. Phillips, (Eds.), *Fertility Transition in South Asia* (281-299). Clarendon: Oxford University Press.

Basu, A. M. (2002). Ultramodern Contraception: Social class and family planning in India. *Asian Population Studies*, 1(3), 303-323.

Basu, K., Foster, J. E. (1998). On Measuring Literacy. *The Economic Journal*, 108(451), 1733-1749.

Basu, K., Foster, J.E., Subramanium, S. (2000). Isolated and Proximate Illiteracy: And Why These Concepts Matter in Measuring Literacy and Designing Education Programmes. *Economic and Political Weekly*, 35(1 & 2), 35-39.

Basu, K., Narayan, A., Ravallion, M. (2002). Is literacy shared within households? Theory and Evidence for Bangladesh. *Labour Economics,* 8(6), 649-665.

Blanc, A. (2001). The effects of power in sexual relationships on sexual and reproductive health: An examination of the evidence. *Studies in Family Planning*, 32(3), 189-213.

Chapagain, M. (2005). Masculine interest behind high prevalence of female contraceptive methods in rural Nepal. *Australian Journal of Rural Health*, 13(1), 35-42.

Char, A., Saavala, M., Kulmala, T. (2009). Male Perceptions on Female Sterilization: A Community-Based Study in Rural Central India. *International Perspectives on Sexual and Reproductive Health*, 35(3), 131-138.

Dang, A. (1995). Differentials in contraceptive use and method choice in Vietnam. *International Family Planning Perspectives,* 21(1), 2-5.

Dutta, M., Husain, Z. (2011). Balancing the Present and the Future: A Study of Contraceptive Use in Calcutta's Slums. *World Health and Population*, 12(3), 23-32.

Dyson, T., Moore, M. (1983). On kinship structure, female autonomy, and demographic behavior in India. *Population and Development Review*, 9(1), 35-60.

Gibson, J. (2001). Literacy and Intrahousehold Externalities. *World Development*, 29(1), 155-166.

Godley, J. (2001). Kinship Networks and Contraceptive Choice in Nang Rong, Thailand. *International Family Planning Perspectives*, 27(1), 4-10 & 41.

Grady, W. R. (1996). Men's perceptions of their roles and responsibilities regarding sex, contraception, and childrearing. *Family Planning Perspectives*, 28(5), 221–226.

Guhbhaju, B. (2009). The influence of wives' and husbands' education levels on contraceptive method choice in Nepal, 1996-2006. *International Perspectives on Sexual and Reproductive Health*, 35(4), 176-185.

International Institute of Population Studies and Macro International, *National Family Health Survey (NFHS-3), 2005–06: India: Volume I*, 2007. Mumbai: IIPS: 11-13.

Iverson, V., Palmer-Jones, R. (2008). Literacy Sharing, Assortative Mating, or What? Labour Market Advantages and Proximate Illiteracy Revisited. *Journal of Development Studies*, 44(6), 797-838.

James, K. S., Nair, S. B. (2005). Accelerated Decline in Fertility in India since the 1980s: Trends among Hindus and Muslims. *Economic and Political Weekly*, 40(5), 375-383.

Jayaraman, A., Mishra, V., Arnold, F. (2009). The relationship of family size and composition to fertility desires, contraceptive adoption and method choice in South Asia. *International Perspectives on Sexual and Reproductive Health,* 35(1), 29-38.

Maddox, B. (2007). Worlds Apart? Ethnographic Reflections on "Effective Literacy" and Intrahousehold Externalities. *World Development*, 35(3), 532-541.

Madhavan, S., Adams, A., Simon, D. (2003). Women's Networks and the Social World of Fertility Behavior. *International Family Planning Perspectives*, 29(2), 58-68.

Mahmood, N., Ringheim, K. (1997). Knowledge, Approval and Communication about Family Planning as Correlates of Desired Fertility among Spouses in Pakisthan. *International Family Planning Perspectives*, 23(3), 122-129 & 145.

Mishra, S. (2005). Secluded and Proximate Illiteracy: Comparing Situations. *Social Indicators Research*, 70(2), 231-242.

Reddy, P.J. (1984). Differential Contraceptive Use among the Slum and Non-Slum Dwellers: A Study of Hyderabad City. *Health and Population - Perspectives & Issues*, 7(2): 115-128.

Schoemaker, J. (2005). Contraceptive Use among the Poor in Indonesia. *International Family Planning Perspectives*, 31(3), 106-114.

Sen, A.K. (1985). *Commodities and Capabilities*. Oxford: Oxford University Press.

Singh S, Darroch J. E., Ashford L. S., Vlassoff, M. (2009). *Adding it Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health*. New York: Guttmacher Institute and United Nations Population Fund.

Speizer I. S., Whittle, L., Carter, M. (2005). Gender Relations and Reproductive Decision Making in Honduras. *International Family Planning Perspectives*, 31(3), 131-139.

Vaughan, P. W., Regis, A., Catherine, E ST. (2000). Effects on an Entertainment-Education Radio Soap Opera on Family Planning And HIV Prevention in St. Lucia. *International Family Planning Perspectives*, 26(4), 148-157.

Walker, M., Unterhalter, E. (ed) (2007). *Amartya Sen's Capability Approach and Social Justice in Education*. London: Palgrave Macmillan.

Wegner M. N., Landry, E., Wilkinson, D., Tzanis, J. (1998). Men as Partners in Reproductive Health: From Issues to Action. *International Family Planning Perspectives*, 24(1), 38-42.

Wilkinson, D. (1997). *Man-myths: Some perceptions from Kenya – Reproductive health attitudes and behavior in three sublocations*. Unpublished paper, AVSC International, New York.