Contraceptive use among illiterate women in India: does proximate illiteracy matter?

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DOES PROXIMATE ILLITERACY MATTER?

1. Introduction

Family planning refers to the use of birth control methods to attain the desired number of children and ensure the desired timing of conceptions and spacing between births. *Birth control* is an umbrella term for techniques and methods used to prevent fertilization, or to interrupt pregnancy at various stages. *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).

Family planning and adoption of birth control measures reduces unintended pregnancies and unsafe abortions, averts maternal and new borne deaths, and leads to a decline in the number of women facing complications due to unsafe pregnancies would decline. Other benefits of using birth control measures are:

- Greater use of condoms for contraception would reduce the transmission of HIV and other sexually transmitted infections, thereby helping to curb the AIDS pandemic.
- Reducing unplanned births and family size would save on public-sector spending for health, water, and sanitation sand social services and reduce pressure on scarce natural resources, making social and economic development goals easier to achieve.
- Reducing unintended pregnancies, particularly among adolescents, would improve educational and employment opportunities for women. This would, in turn, contribute to improving the status of women, increasing family savings, reducing poverty and spurring economic growth.

- Delaying the first pregnancy often helps girls married off at an early age to complete her education. This improves the well being of her family and children.
- In addition, limiting the numbers of children enables the parents to invest more on existing children, improving their educational and health status.

One of the Millennium Development Goals (MDGs) is to improve maternal health (Goal 5), a key means to which is increasing contraceptive prevalence rates. Besides supporting Goal 5, improved reproductive and sexual health underpins nearly all other MDGs. It supports Goal 1 (eradicate extreme poverty and hunger) because smaller families and wider birth intervals allow families to invest more in each child's nutrition and health, and can reduce poverty and malnutrition for all members of a household. Smaller sized families also contribute to improving educational prospects of children and reducing gender disparity in educational outcomes (Goal 2). Freedom to space birth is both an indicator and means of empowerment of women (Goal 3), and helps in reducing child mortality (Goal 4), and curbing the AIDS pandemic (Goal 6). In developing countries, slower population growth can reduce pressure on environmental resources (Goal 7).

The International Conference on Population and Development (ICPD), held in Cairo in 1994, defined reproductive rights as human rights and consequently the governments worldwide have committed to provide sexual and reproductive services available to all. But there still exists a high unmet need for modern contraceptives. A recent study estimates that round 215 million women in the developing world as a whole have an unmet need for modern contraceptives[1]

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

(Singh et al., 2009). Unmet demand is particularly high in developing countries, and among women with low levels of education. Analysis of World Fertility Survey data for developing countries (Martín, 1995) reveals the low (modern) contraceptive prevalence rates (CPR) among illiterate women. CPR ranges from as low as one per cent (Burundi and Mali) to 55 per cent (Thailand). In other Asian countries analyzed it is 44 per cent (Indonesia) and 41 per cent (Sri Lanka). A similar study by Weinberger (1987) also estimates CPR among illiterate women in Asia. She reports CPR to be 6 (Bangladesh), 10 (Jordan), 22 (Malayasia), 2 (Nepal), 4 (Pakisthan), 11 (Phillipines) and 9 (Syria) in percentage terms. 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 is a massive task that requires a huge investment of financial and administrative resources, particularly given the size of this population.[2]

Further, there are substantial 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, opposition from the male partner can thwart

[2] Such women, numbering 193.48 million according to the 2001 Census estimates, comprise 46.33 per cent of India's female population aged above 7 years. Recently released provisional figures reveal that in 2011 there are 272.95 million illiterate women aged 7 years and above, comprising 34.54 per cent of India's female population.

aspirations of the female (Bankole and Singh, 1998; Becker, 1999; Biddlecom et al., 1997; Speizer, 1999; Speizer et al., 2005).[3] In view of the substantial literature documenting male ascendancy over the female partner in deciding to use contraceptives (Mbizvo and Adamchak, 1991; Piotrow et al., 1992), a tactical strategy that may arouse less opposition is to focus on the male partner. This may rich dividends given that men often have a significant influence on wife's attitude towards using contraceptives (Chapagain, 2005; Ezeh, 1993; Gubhaju, 2009). In particular, researchers have documented that educated males are more likely to support their partners in decisions on contraceptive use and family planning (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, 2009).[4]

In this context the concept of proximate illiteracy assumes significant. Based upon the notion of externalities of education, Basu and Foster (1998) have argued that illiterate persons having access to a literate person can derive some benefits of the latter's education and have outcomes superior to that of illiterate persons without such access. When applied to the case of adoption of contraceptive, this structure suggests that even illiterate women may benefit from the education of her male partner – a narrow application of the male education-contraceptive use relationship documented in the literature cited above. This study focuses on illiterate women and compares CPR levels among those women who have literate partners and those whose partners, too, are

[3] Such opposition may arise because of the apprehension that allowing women freedom to make reproductive decisions will: [a] erode the authority of the male partner within the family, [b] encourage the wife to be unfaithful, or [c] loose face within the community (Bawah et al., 1999; Watkins et al., 1997). 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 (Population Council and IGWG, 2001).

[4] 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.

illiterate. It tests the validity of the proximate illiteracy hypothesis by examining whether CPR level is indeed higher among the former group of illiterate women.

The paper is structured as follows: in the second section we discuss the concept of proximate illiteracy, measure of overall literacy level including the proximate illiteracy effect and give a empirical estimate of proximate illiteracy level. Then we narrate the literature survey on proximate illiteracy and describe the database and estimation method. In the third section we present the finding of our analysis to explore whether proximate illiteracy has significant impact on contraceptive decision of illiterate and currently married women. In the final section we conclude.

2. Conceptual Framework

2.1 Proximate illiteracy

A literate person is some one who can read and write. A country's overall level of literacy is usually measured by taking the number of adults who are literates as a percentage of the total number of adults. Now one problem with such kinds of literacy measures is that they ignore two important aspects of literacy – the distribution of literate persons across households, and the external benefits generated by literate members within the household (Basu and Foster, 1998). The presence of a literate person in a household containing illiterate members generates a kind of positive externality for the illiterate members (Basu and Foster, 1998).

For instance, Green et al. (1985) reported that exposure to literacy helped the Gautemalan peasant farmers to adopt modern farm practices, thereby substantially improving their

productivity. This led them to conclude "an illiterate farmer with a literate family is not at a disadvantage to a farmer who is literate himself" (Green et al., 1985, cited in Basu and Foster, 1998, page 1734). Another study by Foster and Rosenzweig (1996) revealed that the productivity of a household farm is linked to the education level of the most educated member of the household and that these productivity gains are greatest at the lowest education levels. Further, there is some evidence to show that the gender of the household member may be important factor in determining the impact on the outcome. Studies report that infant and child mortality appear to be more influenced by maternal literacy than by paternal literacy (Caldwell, 1979; Mensch et al., 1986).

Basu and Foster (1998) argue that, given these externalities, the distribution of literates across households is important. For instance, the literacy rate cannot distinguish between a society where every household contains at least one literate member and another where the same numbers of literates, as in the previous society, are concentrated in the same household. Suppose a certain country has a literacy rate of 40 percent. Now two cases may arise. In one case, the literate population could be highly concentrated and separated from the illiterate population such that, say, every household is either fully literate or fully illiterate. In another case, the literate individuals may be evenly distributed with, say, every household containing at least one literate member. It is claimed by Basu and Foster (1998) that, in the second case, effective literacy rate is higher. That is, the literate household member creates a positive externality for the illiterate member.

Basu and Foster (1998) describe three situations in which literacy is important:

A. A low-skilled job is available which requires the ability to read and write
B. Agricultural extension workers come with information on how to plant and take care of high-yielding varieties. They leave behind brochures explaining these matters.
C. A medical facility is set up in a neighbouring village. The staff distributes pamphlets on methods of preventing disease and infection, as well as information on the various services offered by the facility.

According to Basu and Foster (1998) all of the above opportunities A, B and c are connected with literacy but the connections are not same in all the cases. In case A, the person himself or herself has to be literate to take advantage of the situation. But in cases B and C, the person need not to be literate himself or herself to utilize the opportunity, only access to a literate person who will be willing to provide the requisite literary services is required.

Thus having a literate member in the household can help an illiterate member in accessing information and accomplishing tasks requiring literacy skills. Basu et al. (2000) provides further such examples which reflect the positive impact of presence of a literate member in a household where other members are illiterates:

- The government decides to give social assistance to physically handicapped people, widows and accident victims and likewise publishes its decision in newspapers.
- Agricultural extension workers distribute printed information on new technology relating to irrigation and high yielding crop values.
- Non-governmental voluntary agency distributes leaflets containing information about specific rights of rural people.

- Public health office puts on a bulletin about advantages of oral rehydration.
- The village money lender cheats the borrower altering the amount borrowed by the borrower.

In all the above cases an illiterate individual having a literate member in the household is undoubtedly better off than an illiterate individual having no literate member in the household.

So it is important to distinguish between two types of illiterate persons when assessing the distribution of literacy - a *proximate illiterate***,** an illiterate person who lives in a household with at least one literate member and hence has access to some benefits and an *isolated illiterate*, an illiterate person whose household has no literate members.

2.2 Effective Literacy

A country is considered which consists of n adults and m households. Each household h = 1, 2,…….., m has a household literacy profile, x^h , indicating each adult household members' level of literacy, where

$x_j^h = 1$ means that the *j*th member of household *h* is literate

$= 0$ means that the *j*th member of household *h* is illiterate

The term society is referred to the vector of household profiles $\mathbf{x}= (x^1,\ldots\ldots\ldots\ldots, x^m)$.

So, if x= [(0, 1), (1, 0, 0)] is a society of two households with two and three members, respectively, with each household having exactly one literate member. Now the vector x provides information about the household structure, as well as the literacy level in the country.

The household structure can be ignored by concatenating the household vectors in x to obtain the literacy profile x^0. For example, society x= [(0, 1), (1, 0, 0)] has the literacy profile:

$$x^0 = (0, 1, 1, 0, 0).$$

A Measure of Literacy (MOL) is a mapping

$$L : \Delta \rightarrow R \qquad [1]$$

From the set of all societies to the real numbers, where L (x) represents the overall level of literacy associated with society x and Δ denote the set of all possible societies (with arbitrary population size and number of households).

Now the traditional MOL is given by the literacy rate defined by

$$R(x) = \sum_i x_i^0 / n_x \qquad [2]$$

where $\sum_i x_i^0$ is the number of literate persons in society x. By definition, R(x) is same for all societies having the same literacy profile x^0 and the household structure is ignored by R. We now turn to a new MOL whose definition crucially depends on the specific assignment of individuals to households.

Now having a literate person in household provides external benefits to illiterate members of the same household. Let us assume that the magnitude of these benefits, say, α ($0<\alpha<1$) is independent of household members. Then the *effective* literacy profile for household h, denoted by

$$\tilde{x}_j^h = 1 \text{ if, } x_j^h = 1$$

$$= \alpha \text{ if, } x_j^h = 0, \text{ and } x_k^h = 1 \text{ for some } k \neq j$$

$$= 0 \text{ if } x_k^h = 0 \text{ for every } k \qquad [3]$$

The overall effective literacy profile, which we denote by x^*, is simply the literacy profile obtained from the resulting vector of effective household profiles; that is,

$$x^* = (x^1, \ldots\ldots\ldots\ldots, x^m) \qquad [4]$$

If the society x= [(0, 1), (1, 0, 0), (0, 0)], then x^* = (α, 1, 1, α, α, 0, 0). This transformation leaves the literacy levels of the literates and isolated illiterates unchanged and also assigns every proximate illiterate the effective literacy level α. The magnitude of α reflects the extent of benefits received by an illiterate member of a family due to the presence of a literate member in the same family.

Now the overall measure of effective literacy

$$L^*(x) = \sum_i x_i^* / n_x \qquad [5]$$

when $L^* = R+\alpha P$.

In other words, the number of effective literate population (L^*) is the sum of the literacy rate R and α times P, the share of population that is proximate illiterate.

If there is no external benefit to an illiterate person from a literate person living in the same household then, α = 0 and L^* reduces to the usual literacy rate, R. Again, if having a literate person in the household gives an illiterate person access to full range of literacy (that is, α=1), then $L^* = R+P$.

Subsequently, the concept of proximate illiteracy was extended by Paola Valenti (2002) and Dutta (2004), who argued that mere presence of an illiterate person in the household was a crude

measure. Instead, they suggested, we should consider either the *total number* of literate persons in the household (as different literate persons may have alternative skills), or *proportion* of literate persons in the household (to incorporate the notion of competitive use of literate person's skills).

2.3 Empirical estimates of α

Basu and Foster (1998) suggest that the divergence between Literacy Rate and Effective Literacy Rate crucially depends upon the magnitude of α. While the authors have presented some evidence on how results of literacy level analysis may change, their discussion was based on an ad hoc value of α. The first attempt to empirically estimate the magnitude of α was made by Gibson (2001) in a study that related children's height with mother's education. This approach is described below.

Let Y be an outcome variable (in this case height of children aged 0-5 years) which is affected by some measure of literacy (L), other characteristics represented by the vector X, and a random error term(u) such that:

$$Y = \beta X + \gamma L + u \qquad [6]$$

Now substituting the Basu-Foster measure of effective literacy given by $L^* = R+\alpha P$, in the above equation we get:

$$Y = \beta X + \gamma(R + \alpha P) + u \qquad [7]$$

or, $$Y = \beta X + \gamma R + \alpha\gamma P + u$$

or, $$Y = \beta X + \gamma R + \alpha\gamma P + u$$

or, $$Y = \beta X + \gamma R + \theta P + u \qquad [7a].$$

The model [7a] may be estimated with X, R and P as explanatory variables. The effective literacy level of a proximate illiterate, α, can be calculated from the ratio of the coefficients of P and R.[5]

Gibson estimated [7a] using data from the 1996 Papua New Guinea Household Survey, with appropriate control variables (gender of child, per capita expenditure, and dummies for residence in urban/rural areas and highland/lowland areas). The estimated values of θ and γ were 0.047 and 0.062, respectively; hence, Gibson's results indicate $\alpha = \theta / \gamma = 0.76$.

2.4 Does Proximate Illiteracy Matter?

In a subsequent study Basu et al. (2002) attempted to empirically prove that proximate illiteracy had a substantial impact on labour market outcomes. The analysis was based on data from the Household Expenditure Survey for Bangladesh, 1995–1996 (Bangladesh Bureau of Statistics, 1998). The objective of the study done by Basu et al. (2002) was to check whether proximate illiteracy has any impact on wages; that is, whether the presence of a literate household member helps an illiterate person to get higher wages.

Now to check the above hypothesis Basu et al. (2002) ran a regression equation taking log of wage earnings as dependent variable. Only illiterate respondents are considered in the dataset. Basu et al. (2002) assumed that the labor earnings (Wj) function took the form:

$$\log W_j = \alpha LIT_j + \beta X_j + \varepsilon_j \qquad [8]$$

[5] Since, $\alpha = \theta / \gamma = \alpha\gamma / \gamma$.

where LITj is a dummy variable which takes the value 1 if at least one person in the household is literate (that is when the Proximate illiteracy effect is present) and takes the value 0 when there are no literate individual in the household (that is when proximate illiteracy effect is absent), and Xj is a vector of k control variables for person j comprising other factors that influence the worker's productivity (and hence wages). In the above wage equation, the variables in the vector X include age of the earner, square of the age, a dummy variable that takes the value 1 if the earner has been to school, the maximum level of education in each household and a series of regional dummies to allow for geographic effects.

A problem with regressing wages directly on proximate illiteracy and other control variables (as in 8) is the presence of a *sample selectivity bias*. This occurs when the dependent variable is only observed for a restricted, nonrandom sample. For instance, it is obvious that the wages of only those workers can be observed who form of the workforce. This would not have been a problem if a random set of the sample had formed the workforce. A reasonable objection to this assumption is that those who join the workforce are smarter or more productive than those who are not chosen for the job. As this latent ability - which distinguishes an employed worker from an unemployed one - cannot be taken in consideration in the above wage equation, an *omitted variable bias* arises. In such a situation, the OLS model may lead to over-estimate of the actual wage rate.

To solve this problem Heckman (1979) suggests that we use a two stage regression model. In the first stage, a probit *selection model* is estimated in which employment status of respondents (whether working or not) is regressed on the explanatory variables (including proximate

illiteracy in this case) for the full sample. The dependent variable here is probability of getting employed is a dummy variable which takes the value 1 when respondent is employed and takes the value 0 when the respondent is not employed. This model is used to predict probabilities of working for each respondent. In the second stage, a transformation of these probabilities[6] is incorporated into the wage model as an additional explanatory variable to correct for self selection. The second model is estimated only for those respondents who are employed. The results are reported in Table 1.

Table 1. Proximate illiteracy and Labour Market outcomes

Sample	**Model**	**Coefficient (t-ratio)**	**Whether Proximate illiteracy (PL) effect is present**
Women	earnings (α)	0.504 (4.577)	Significant PL effect observed
	participation (δ)	-0.256 (-3.512)	PL effect present but found to be negative
Men (rural)	earnings (α)	0.146 (2.769)	Significant PL effect observed
	participation (δ)	0.110 (1.980)	Significant PL effect observed
Men (urban)	earnings (α)	0.144 (2.274)	Significant PL effect observed
	participation (δ)	-0.023 (-0.153)	No significant PL effect observed

Source: Basu et al. (2002): 660

A significant and positive proximate illiteracy effect may be observed in the case of the wage equation. In the case of the selection model, however, results are ambiguous, with expected

[6] The *Inverse Mills Ratio* is estimated as follows:

$\lambda(\alpha) = f(\alpha) / [1 - F(\alpha)]$ if $\alpha > a$

$\lambda(\alpha) = f(\alpha) / F(\alpha$ if $\alpha < a$

when α is the probability of working, f(α) is the probability density function, F(α) is the cumulative density function and a is the truncation point (Greene, *YEAR*: 759).

results being observed only for rural males. Proximate illiteracy does not have any impact on urban males, while it is surprisingly negative among females.[7]

The methodology and interpretation of results were criticized by Iverson and Palmer-Jones (2008) on several counts. The authors argued that proximate illiteracy is a flow that is strongly conditioned by socio-cultural characteristics. This implies that a more appropriate methodology would be to disaggregate the sample by socio-cultural groups and undertake the analysis by each of these groups. Secondly, an alternative explanation of the results may be in terms of selection into marriage. This implies that more productive women may have a higher chance of getting married to literate males.[8] Thus, their latent ability – and not proximate illiteracy – results in them earning higher wages.

2.5 Database and estimation method

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.[9] 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

[7] A possible explanation of this unexpected result is in terms of the Cournot-Nash intra-household bargaining approach (Agarwal, 1994; Sen, 1993). Literate husbands may discourage their wives to work so as so prevent the latter from enjoying benefits that stem from economic empowerment. If women become empowered through participation in economic activities their fall back position and bargaining power within the household may rise, adversely affecting the intra-household distribution of consumption and other resources.

[8] Basu et al. (2002) had tested for non-randomness of marriage by comparing earnings of married and unmarried women. He found that unmarried illiterate women earn higher wages than married illiterate women, which rules out the possibility that women with greater latent ability get married earlier than those without such ability. A methodological problem with this test is that the group of unmarried women includes divorcees and widows.
According to Iverson and Palmer-Jones, a better test for presence of selection into marriage is to compare wages of recently married with longer married proximate illiterate women. A high wage of proximate illiterate women who have recently married would support the hypothesis of selection into marriage, since the transmission of literacy benefits from husband to wife is unlikely to be instantaneous.

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

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 women without education (constituting 32 per cent of the sample) were selected. The socio-economic characteristics of the sample are given in Appendix (Table A.1). Information on education level of partner is recoded to classify women as having either illiterate or literate partners. About 46 per cent of these women had illiterate partners. Predictably, this proportion is higher among those who resided in rural areas. This variable captures the impact of proximate illiteracy.[10]

Some important characteristics of the sample being analyzed are stated below. Details are given in Appendix Table A.1 and A.2.

[10] 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 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.

- Most of the respondents are from Central Indian states[11], 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%).
- 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%).
- 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.
- 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.
- 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

[11] States are divided into five geographical zones as below:
- North Indian states – Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana, Uttaranchal, Delhi, Rajasthan, and Uttar Pradesh.
- South Indian states – Andhra Pradesh, Karnataka, Kerala and Tamil Nadu.
- East Indian states- Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Assam, West Bengal, and Orissa.
- West Indian states- Gujarat, Maharashtra and Goa.
- Central Indian states- Bihar, Jharkhand, Chhattisgarh and Madhya Pradesh.

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 poorest group are proximate illiterates, this figure is 81 per cent among the wealthiest group.

- About 47 per cent of respondents residing in rural areas are engaged in economic activities; in urban areas, this proportion is 64 per cent. The proportion of proximate illiterates is higher among unemployed respondents (58%), compared to employed respondents (50%).
- 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 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.

In the next section, we undertake a bivariate analysis of the impact of proximate illiteracy across the socio-economic determinants of contraceptive use. This is followed by a multivariate in which the decision to use 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 contraceptive, or does not),

the appropriate regression model is logit model.[12] This model is initially estimated for the all-India sample (Total, Rural and Urban). Now one criticism of Basu et al. (2002) by Iverson and Palmer-Jones (2008) was that such analysis should be undertaken at a more disaggregate level. The justification was that the impact of proximate illiteracy is conditioned by socio-cultural factors. Therefore, they argue, disaggregate-level analysis should be carried out for groups defined in terms of correlates like socio-religious identity, geographical zones, etc. In line with their suggestion, 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 2-5 present the results of the bivariate analysis for the impact of being a proximate illiterate compared to being an isolate illiterate on contraceptive use. Contraceptive prevalence rates 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.

Table 2: Results of bivariate analysis for demographic variables

Correlate	Groups	Partner's education		Difference
		Literate	Illiterate	
Geographical zone	North	54.67	50.21	4.46
	Central	38.82	32.64	6.18
	East	39.09	36.11	2.98

[12] A probit model may also have been used. Although the choice of the regression model (between logit and probit) depends upon the distribution of the error term, in most cases the difference between the two models is marginal.

Correlate	Groups	Partner's education		Difference
		Literate	Illiterate	
	West	65.21	63.07	2.14
	South	69.86	70.68	-0.81
Type of place of residence	Urban	55.95	51.28	4.67
	Rural	46.10	42.93	3.17
Age 5-year groups	15-19	4.70	4.22	0.48
	20-24	22.12	18.82	3.29
	25-29	44.02	40.22	3.80
	30-34	58.92	53.38	5.54
	35-39	62.68	57.17	5.51
	40-44	60.13	54.39	5.75
	45-49	59.72	52.16	7.56
Marital duration (grouped) [excludes: married gauna not performed]	0-4	8.45	5.54	2.91
	5-9	31.05	25.69	5.36
	10-14	51.87	45.35	6.52
	15-19	60.91	57.44	3.47
	20-24	63.83	56.53	7.30
	25-29	61.29	55.05	6.25
	30+	62.00	52.99	9.00
Gender of last child	No child	2.09	1.30	0.79
	Male	55.00	49.51	5.49
	Female	48.13	43.80	4.33

Table 2 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 reported in various studies (Dyson and Moore, 1983; Bardhan, 1974; Basu, 1992; Miller, 1981). 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.

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 becomes 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 does increase with age and (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 here (Arnold, 2001; Jayaraman et al. 2009; Roy et al. 2008; Saha and Bairagi 2007), 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, 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 3: Results of bivariate analysis for socio-cultural variables

Correlate		Partner's Education		Difference
		Literate	Illiterate	
Socio Religious Identity	Muslim	37.39	32.20	5.19
	H-SC	50.67	48.46	2.21
	H-ST	46.02	44.05	1.97
	H-OBC	51.26	50.59	0.67
	H-FC	58.32	56.64	1.68
	Others	41.43	34.41	7.01
Frequency of listening to radio	Not at all	49.57	44.23	5.34
	Less than once a week	46.51	44.32	2.19
	At least once a week	47.73	45.24	2.49
	Almost every day	51.43	50.66	0.78
Frequency of viewing TV	Not at all	40.72	37.61	3.10
	Less than once a week	44.34	45.56	-1.23
	At least once a week	53.11	55.64	-2.54
	Almost every day	62.02	63.07	-1.05

Researchers have reported that contraceptive uses are low within the Muslim community, though the explanation for this observation has varied (Alagarajan & Kulkarni, 2008; Bhat, 2005; James & Nair, 2005; Kulkarni & Alagarajan, 2005). On the other, advantaged communities (HFCs) have higher CPRs. 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).

Public media (television and radio) have a strong influence on CPR, and can be an important substitute for education of respondent or her partner. It is observed that proximate illiteracy effect is higher for respondents who do not watch TV or listen to radio (5.34 and 3.10 percentage points, respectively). On the other hand, this effect is only 0.78 and -1.05 percentage points for respondents who watch TV or listen to the radio 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 4: Results of bivariate analysis for economic variables

Correlate		Partner's Education		Difference
		Literate	Illiterate	
Wealth index	Poorest	35.54	34.43	1.11
	Poorer	43.15	44.14	-0.99
	Middle	49.03	53.24	-4.22
	Richer	57.85	59.54	-1.69
	Richest	65.84	60.00	5.84
Recode of partners occupation	All others	49.01	46.75	2.26
	White collar jobs	55.37	49.20	6.17
	Sales	48.89	45.02	3.86
	Services	54.74	53.80	0.94
	Manual labour	47.29	42.02	5.27
Recode of respondent occupation	Not Employed	45.49	37.76	7.73
	Employed	52.92	50.10	2.82

The results of the bivariate analysis for economic variables are presented in Table 4. 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.

Table 5 also shows that the proximate illiteracy effect is highest for those respondents having partners doing white collar job (6.17 percentage points), followed by respondents whose husbands work as manual labours (5.27 percentage points). Employment status of the respondent is another 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.

Table 5: Place of delivery

Place of last delivery	Education of Partner		Difference
	Illiterate	Literate	
No birth	1.30	2.09	-0.79
Home delivery	48.53	54.37	-5.84
Safe delivery	39.25	38.12	1.13

It is also interesting to see whether institutional factors like place of last birth determine the strength of proximate illiteracy effect. The results are ambiguous. While respondents who have delivered their last child at home have higher CPR levels if their partner is illiterate, in the case of institutional delivery the impact of proximate illiteracy is positive but not very high (1.13 percentage points).

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. The complete list of variables is as follows:

1. Demographic

a) Geographical zone

b) Place of residence of the respondent

c) Age and square of age of the respondent

d) Marital duration

e) Number of living sons or daughters

f) Gender of last child

2. Socio-Cultural

a) Socio religious groups

b) Frequency of watching TV

3. Economic

a) Employment status of the respondent

b) Occupation of the partner.

c) Wealth index score

4. Institutional

a) 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 case of modelling binary dependent variables, assumptions fundamental to linear regression are violated. That is, the assumptions of normality, linearity and homoscedasticity do not hold if we use binary type dependent variable. Therefore, to estimate models with binary dependent variable we need to go for Logistic regression which allows for estimating the probability that an event occurs or not by predicting a binary dependent outcome based on a set of independent variables. Logistic regression does not try to minimize the sum of squares of residuals, but rather uses the method of Maximum Likelihood Estimation (MLE) to estimate the parameters of the model. A probit model may also have been used for modeling the binary dependent variable. Now, the selection between a logit and a probit model depends upon the distribution of the error term. When the error term follows a logistic distribution, a logit model is used; on the other hand, if the error term follows a normal distribution, a probit model is appropriate. But in most cases, difference between the two models is marginal, so that choice of models is not of any significance. We have therefore estimated a logit model, whose results are presented in Table 5.

Table 5: Results of Logit Model for All India – Total, Rural & Urban:

Variables	All India - Total			All India – Rural			All India - Urban		
	Odd ratio	z	P>z	Odd ratio	z	P>z	Odd ratio	z	P>z
Isolate (RC)	1.00			1.00			1.00		
PLEFFECT	1.08	2.48	0.01	1.08	2.32	0.02	1.07	1.27	0.20
Central (RC)	1.00			1.00			1.00		
North	1.80	14.81	0.00	2.14	15.84	0.00	1.25	3.02	0.00
East	1.18	4.09	0.00	1.35	6.31	0.00	0.88	-1.69	0.09
West	2.73	18.55	0.00	3.19	17.26	0.00	1.99	7.42	0.00
South	3.66	23.83	0.00	3.79	19.53	0.00	3.31	12.8	0.00
Urban (RC)	1.00								
Rural	0.96	-1.05	0.29						
Age of respondents	1.51	26.31	0.00	1.54	23.31	0.00	1.42	11.85	0.00
Square of age of respondents	0.99	-28.15	0.00	0.99	-24.66	0.00	0.99	-13.31	0.00
Duration of marriage	1.34	13.22	0.00	1.34	11.22	0.00	1.36	7.42	0.00
No. of living sons	1.20	13.71	0.00	1.19	10.62	0.00	1.25	8.58	0.00
No. of living girls	0.86	-12.23	0.00	0.84	-12.41	0.00	0.92	-3.39	0.00
Male child (RC)	1.00			1.00			1.00		
No child	0.03	-19.90	0.00	0.04	-16.86	0.00	0.20	-10.38	0.00
Female child	0.98	-0.58	0.57	0.96	-1.12	0.26	1.04	0.70	0.48
Hindu OBC (RC)	1.00			1.00			1.00		
Muslim	0.53	-13.90	0.00	0.45	-13.64	0.00	0.63	-6.03	0.00
Hindu Scheduled Caste	1.03	0.71	0.48	1.02	0.42	0.67	1.04	0.53	0.59
Hindu Scheduled Tribe	1.06	1.12	0.26	1.02	0.28	0.78	1.08	0.57	0.57
Hindu Forward class	1.07	1.42	0.16	1.10	1.76	0.08	1.01	0.15	0.88

Variables	All India - Total			All India – Rural			All India - Urban		
	Odd ratio	z	P>z	Odd ratio	z	P>z	Odd ratio	z	P>z
Other Socio Religious Groups	0.59	-9.29	0.00	0.54	-9.43	0.00	0.73	-2.44	0.02
Does not watch TV (RC)	1.00			1.00			1.00		
Watches TV occasionally	1.21	4.43	0.00	1.21	3.94	0.00	1.19	1.98	0.05
Watches TV at least once a week	1.63	10.65	0.00	1.62	8.63	0.00	1.69	6.26	0.00
Watches TV frequently	1.81	14.06	0.00	1.70	9.69	0.00	1.99	9.75	0.00
Respondent is unemployed (RC)	1.00			1.00			1.00		
Respondent is employed	1.37	10.59	0.00	1.33	8.05	0.00	1.52	7.23	0.00
Partner works as labourer	1.00			1.00			1.00		
Partner does other jobs	1.06	1.76	0.08	1.08	2.19	0.03	0.83	-2.07	0.04
Partner is in sales sector	1.04	0.71	0.48	1.01	0.15	0.88	1.06	0.83	0.41
Partner does white collar job	0.98	-0.31	0.75	0.95	-0.58	0.56	1.04	0.40	0.69
Partner is in service sector	1.02	0.30	0.76	1.01	0.13	0.89	1.04	0.42	0.67
Wealth index	1.19	11.14	0.00	1.17	8.19	0.00	1.21	6.77	0.00
Birth at home (RC)	1.00			1.00			1.00		
Institutional delivery	0.82	-3.94	0.00	0.74	-4.63	0.00	0.92	-1.02	0.31
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		

The model statistics are satisfactory. 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). While this value is not very high, it is acceptable on two grounds.

a) It is not possible to compute the standard goodness of statistic for limited dependent variable models. The reason is that model estimates from a logistic regression are maximum likelihood estimates arrived at through an iterative process. They are not calculated to minimize variance, so the OLS approach to goodness-of-fit does not apply. However, to evaluate the goodness-of-fit of logistic models, several pseudo R^2's have been developed. These are referred to as "pseudo" R^2's because they look like R^2 in the sense that they are on a similar scale, ranging from 0 to 1 (though some pseudo R^2's never achieve 0 or 1) with higher values indicating better model fit, but they cannot be interpreted as one would interpret an OLS R^2 and different pseudo R^2's can arrive at very different values. The substitute measures only provide an approximation, and are of limited value.

b) 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.

Given these two issues, therefore, the values of pseudo R^2 obtained in the three models is quite satisfactory.

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 (PLIT). Since we have reported odd ratios in Table 5, 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 (OR=1.28; z=2.48) and Rural sample (OR=1.08; z=2.32). 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 (z=1.27).

Most of the demographic control variables are statistically significant. Respondents living in North (OR=1.8; z=14.81), East (OR=1.18, z=4.09), West (OR=2.73, z=18.55) and South India (OR=3.66, z=23.83) are significantly more likely to use modern contraceptives than respondents from Central India. While this is also true in Rural India,[13] in urban areas, women from East India (OR=0.88; z=-1.69) are less likely to use contraceptives than Central Indian women.[14] 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 constant. Prevalence of CPR among rural respondents is not statistically different from that in urban areas (z=-1.05).

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 (Total: OR=1.51, z=26.31;

[13] OR and Z for zones in Rural India are: North (OR=2.14, z= 15.84), East (OR=1.35, z=6.31), West (OR= 3.19, z=17.26) and South (OR=3.79, z=19.53)

[14] OR and z for zones in urban India area s follows: North (OR=1.25, z= 3.02), West (OR= 1.99, z=7.42) and South (OR=3.31, z=12.80).

Rural: OR=1.54, z=23.31; Urban: OR=1.42, z=11.85). However, as demand for contraceptive is linked to biological processes, with its need getting reduced as the women becomes older,[15] the relationship is expected to be non-linear. The coefficient of the square of age is expectedly significant negative and significant at 1% level (Total: OR=1.51, z=26.31; Rural: OR=1.54, z=23.31; Urban: OR=0.99, z=-13.31). Similar to age, contraceptive use and duration of marriage is found to be positively related (India: OR=1.34, z=13.22; Rural: OR =1.34, z=11.22; Urban: OR=1.36, z=7.42).

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 (Total=1.20; Rural=1.19; Urban=1.25), that of living daughters is less than unity (Total= 0.86; Rural=0.84; Urban=0.92). 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 (India: OR=0.98, Rural: OR=0.96 Urban: OR=1.04), though coefficients are not statistically significant.[16] Predictably, childless respondents have OR less than unity (Total=0.03, Rural=.04, Urban=0.20) 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 (z for

[15] 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).

[16] 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. (Becker et al., 1960; Filmer et al., 2008). 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; Kabir et al. 1994; Visaria 1994).

HFC=1.42, HSC-0.71, HST- 1.12). However, religious minorities (both Muslims and non-Muslims) have a lower CPR (Muslims: OR=0.53, z=-13.9; Other SRCs: OR=0.59, z=-9.29). This may be observed for rural and urban areas.[17]

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 (OR=1.21, 1.63 and 1.81, respectively; z=4.43, 10.65 and 14.06, respectively). 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 (Shapiro & Tambashe, 1994). If the respondent is employed she is significantly more likely to adopt contraceptives (OR=1.37, z=10.59). 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 (z=0.71, -0.31, 0.30, respectively). The residual occupational group (whose partner is engaged in agricultural activities) have significantly different CPRs than the reference category (Total: OR=1.06, z=1.76; Rural: OR=1.08, z=2.19; Urban: OR=0.83, z=0.83).

[17] In rural areas, coefficient of HFC is significant at 10% level (OR=1.1, z=1.76).

The wealth index score provided in the DHS dataset is positively related to contraceptive use (OR=1.19, z=11.14). 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).

The final variable, dummy for place of birth, reveals that women whose last birth was in a public or private health facility are less likely to use contraceptives (Total=0.82, Rural=0.74). In urban areas, this variable is not significant at 10% level (z=-1.02).

3.3 Analysis at disaggregate level

Now, Iverson and Palmer Jones (2008) defined proximate illiteracy as a flow whose magnitude depends on several socio-cultural characteristics. This is particularly important in a country like India, where the population is fragmented by caste, ethnicity and religion, and where patterns of behavior vary across socio-religious groups and are subject to spatial variation. In such circumstances, they argue, aggregative analysis does not make much sense by itself, and should be supplemented by analysis of sub-samples at a more disaggregate level. This method would take care of the omitted variable bias leading to a spurious relationship at the aggregate level.

Accordingly, we have divided 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, wealth index[18] and gender of last child. The results for the sub-samples formed using each of these criteria are stated

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

below. 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. The results are stated in Table 6.

Table 6: Results of Logit Model by Selected Groups – All India level

Groups	Variable	Odd ratio	z	Prob >z	N	Pseudo R^2	χ^2
Zone	North	1.12	**1.82**	0.07	6192	0.21	1828.99
	South	1.11	1.03	0.30	2958	0.27	993.41
	East	0.99	-0.13	0.90	6280	0.13	1079.93
	West	1.35	**2.77**	0.01	2507	0.27	885.54
	Central	1.15	**2.76**	0.01	10436	0.78	2452.87
SRC	Muslim	0.97	-0.43	0.67	4793	0.15	933.64
	Hindu Scheduled Caste	1.10	1.49	0.14	5722	0.23	1802.77
	Hindu Scheduled Tribe	1.10	1.02	0.31	3116	0.22	919.50
	Hindu Forward class	1.00	-0.02	0.99	3835	0.20	1030.25
	Other Socio Religious Groups	1.32	**2.56**	0.01	2422	0.24	768.18
	Hindu Other Backward Classes	1.18	**3.06**	0.00	8485	0.23	2754.72
Marital duration	0-4 years	1.28	1.55	0.12	3362	0.16	272.13
	5-9 years	1.2	**2.42**	0.02	5008	0.19	1146.92
	10-14 years	1.09	1.21	0.23	4680	0.14	921.64
	15-19 years	0.9	-1.52	0.13	4820	0.12	784.81
	20-24 years	1.14	**1.85**	0.06	4661	0.14	863.33
	25-29 years	1.1	1.2	0.23	3714	0.13	671.86
	30+ years	1.24	1.96	0.05	1860	0.13	324.01
Wealth Index	Poorest	1.14	**2.22**	0.03	7561	0.17	1647.28
	Poorer	1.15	**2.35**	0.02	6882	0.22	2068.08
	Middle	0.96	-0.71	0.48	6724	0.21	1924.3
	Richer	0.99	-0.18	0.86	5100	0.19	1296.81
	Richest	1.45	**2.89**	0.00	2106	0.17	463.77
Employment	Employed	1.06	1.53	0.13	14685	0.21	4242.88

Groups	Variable	Odd ratio	z	Prob >z	N	Pseudo R^2	χ^2
status of respondents	Unemployed	1.11	**2.38**	0.02	13688	0.21	3829.03
Partner's occupation	Partner does other jobs	1.06	1.23	0.22	10954	0.21	3094.13
	Partner is in sales sector	1.02	0.16	0.88	2548	0.19	659.65
	Partner does white collar job	1.00	-0.03	0.98	1303	0.17	303.07
	Partner is in service sector	0.85	-1.13	0.23	1469	0.24	478.09
	Partner works as labourer	1.16	**3.23**	0.00	12099	0.23	3729.68
Gender of last child	No child	1.50	1.09	0.28	2140	0.08	29.71
	Female child	1.09	**2.07**	0.04	12514	0.17	2920.31
	Male child	1.06	1.36	0.17	13719	0.16	3002.45

Important results are as follows:

a) *Geographical zones*: Results show that PLEEFECT is significant at 1% level only in North West OR=1.35, z=2.77) and Central (OR= 1.15, z=2.76), and at the 10% level in North (OR=1.12, z=1.82).

b) *Socio-religious groups*: The coefficient of PLEFFECT is statistically significant only among HOBCs (OR= 1.18, z=3.06) and Other SRCs (OR= 1.32, z=2.56) at the 1% level. The coefficient of PLEFFECT is insignificant at the 10% level for all other SRCs.

c) *Employment status*: If we divide respondents on the basis of their engagement in economic activities into employed and unemployed women, we find that PLEFFECT is significant effect only among unemployed respondents (OR= 1.11, z=2.36).

d) *Wealth Index*: Table 6 shows that the coefficient of PLEFFECT has significant effect on adoption of contraceptives for respondents belonging to the two poorest (OR=

1.14, z=2.22; and OR= 1.15, z=2.35, respectively) and richest (OR= 1.45, z=2.86) wealth index groups.

e) Partner's Occupation: PLEFFECT is significant only in the case of respondents whose partners are manual labourers (OR=1.16, z=3.23 at 1% level).

f) *Gender of last child*: PLEFFECT has significant effect on adoption of contraceptives (OR= 1.09, z=2.07 at 5% level) only for respondents whose last child is female.

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.[19] This analysis reveals almost similar results (See Appendix Table A.3). The only differences are with respect to the wealth index sub-samples – in Table 4 we found PLEFFECT to be significant among the poorest two and richest sub-samples, while in the case of Rural sub-sample, PLEFFECT is significant only for the poorest sub-sample.

3.4 Discussion

From the aggregative analysis it is found that PLEFFECT is significant for both the all India and rural sample but it is found to be insignificant for the illiterate married women living in urban areas. 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). Hence the impact of PLEFFECT remains insignificant in case of urban respondents signifying that partner's education does not have any

[19] We have not estimated the models for urban sub- samples as PLEFFECT was not significant in the urban sample.

significant effect on the adoption of contraceptives by urban illiterate women as social networks and other sources act as sub sources of information from outside the dyad. 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.

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 (Dev et al., 2002; Guilmoto and Rajan 2001; James and Nair, 2005). 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 6). 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.

Our analysis also supports the finding of other researchers (Alagarajan, 2008; Bhatt, 2005; Iyer, 2002; James and Nair, 2005; Kulkarni & Alagarajan, 2005) that the Muslims are less likely to adopt contraceptives. While bivariate analysis reveals that the strength of proximate illiteracy is also high among Muslims – as well as among non-Muslim minorities – this effect appears

insignificant in the disaggregative analysis (Table 6). 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.

While income and CPR is observed to be positively related in keeping with existing studies (Schoenmaker, 2005), proximate illiteracy is observed among the poorer households. 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).

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.

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.

4. Conclusion

To sum up, our study does not find any strong evidence of any significant transmission of information related to family planning methods from a literate person to his illiterate partner. Although the coefficient of PLEFFECT is statistically significant for the all-India and rural samples, it is insignificant not only for the urban sample but also most of the sub-samples (Section 3.3). Thus, there appears little evidence in support of the Basu-Foster proximate illiteracy effect in relation to reproductive health. This is very important, given the asymmetry between partners with respect to reproductive decisions (Bankole and Singh, 1998; Becker, 1999; Biddlecom et al., 1997; Speizer, 1999; Speizer et al., 2005) and the tendency of men to act as "gate keepers" of family welfare (Char et al., 2009).

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 has two implications. Methodologically, 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. Secondly, with regard to policy design, it may be strategic 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.

A second reason for the failure to find evidence of any significant flow of information between partners may lie in barriers to such transmission. 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.

Finally, we should not overlook the presence of various alternative sources of information about reproductive issues other than the partner. As pointed out by Godley (2001) and Madhavan et al. (2003) access to networks and contacts with kins may reduce dependence of an illiterate woman on her partner. Government policies like *Swarna Jayanti Sahari Yojana* and *Swarna Jayanti Grameen Swarojgar Yojana* and seeking to empower women through formation of Self Help Groups may also serve, indirectly, 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 5 shows that women who watch TV infrequently are 21 per cent more likely to use contraceptives than those without access to TV; this percentage goes up to 63 and 81 for those who watch TV 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 TV – among women who watch TV, 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 TV is an important source of information about family planning. Hence, the current reliance of the Government on public media is fully justified.

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 health workers and ASHAs (Accredited Social Health Activist).

REFERENCES

Agarwal, B. (1994), *A Field of One's Own: Gender and Land Rights in South Asia,* Cambridge: Cambridge University Press.

Agha, S. and Rossem, R. V. (2002), 'Impact of Mass Media Campaigns on Intentions to Use The Female Condom in Tanzania', *International Family Planning Perspectives*, vol. 28, No. 3, pp. 151-158.

Alagarajan, M. and Kulkarni, P. M. (2008), 'Religious Differentials in Fertility in India: Is There Convergence?', *Economic and Political Weekly*, vol. 43, No. 48, (Nov. 29), pp. 44-53.

Arnold, F. (1992), 'Sex Preference and Its Demographic and Health Implications', *International Family Planning Perspectives,* vol. 18, No. 3, pp. 93-101.

Arnold, F. (1997), *Gender Preferences for Children*. DHS Comparative Studies no. 23, Macro International. Calverton, MD.

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

Arnold, F., Choe, M. K. and Roy, T. K. (1998), 'Son Preference, the Family-building Process and Child Mortality in India', *Population Studies*, vol. 52, No. 3, pp. 301-315.

Bardhan, P. K. (1974), 'On life and death questions', *Economic and Political Weekly*, vol. 9, Special Number, pp. 32-34.

Bankole, A. and Singh, S. (1998), 'Couples' Fertility and Contraceptive Decision-Making In Developing Countries: Hearing the Man's Voice, International Family Planning Perspectives, vol. 24, No. 1, pp. 15-24.

Basu, A. M. (1992), *Culture, the Status of Women, and Demographic Behaviour: Illustrated with the Case of India*, Clarendon: Oxford University Press.

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

Basu, K., Foster, J. E. and Subramanian, S. (2000), 'Isolated and Proximate Illiteracy: And Why These Concepts Matter in Measuring Literacy and Designing Education Programmes', *Economic and Political Weekly*, vol. 35, No. 1/2 (Jan. 8-14), pp. 35-39.

Basu, K. and Foster, J. E. (1998), 'On Measuring Literacy', *The Economic Journal*, vol. 108, No. 451, pp. 1733-1749.

Bawah, A. A., Akweongo, P., Simmons, R. and Phillips, J. F. (1999), 'Women's fears and men's anxieties: The impact of family planning on gender relations in northern Ghana', *Studies in Family Planning,* vol. 30, No. 1, pp. 54–66.

Becker, G. S. (1960), 'An Economic Analysis of Fertility', in Ansley J. Coale, ed., *Demographic and economic change in developed countries*. Princeton, NJ: Princeton University Press, pp. 209-40.

Biddlecom, A. E., Casterline, J. B. and Perez, A. E. (1997), *International Perspectives on Sexual and Reproductive Health*, vol. 32, No. 3, pp. 108-115.

Blanc, A. (2001), 'The effects of power in sexual relationships on sexual and reproductive health: an examination of the evidence', *Studies in Family Planning*, vol. 32, No. 3, pp. 189–213.

Char, A., Saavala, M. and Kulmala, T. (2009), 'Male Perceptions on Female Sterilization: A Community-Based Study in Rural Central India', *International Perspectives on Sexual and Reproductive Health*, vol. 35, No. 3, pp. 131-138.

Caldwell, J. C. (1979), 'Education as factor in mortality decline', *Population Studies*, vol. 33, No. 3, pp. 395-13.

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

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

DeRose, L. F., Dodoo, F. N., Ezeh, A. C. and Owuor, T. O. (2004), 'Does Discussion of Family Planning Improve Knowledge Of Partner's Attitude Toward Contraceptives?', *International Family Planning Perspectives*, vol. 30, No. 2, pp. 87-93.

Dutta, I. (2004), 'Generalized Measures of Literacy', *Mathematical Social Sciences,* vol. 48, No. 1, pp. 69-80.

Dutta, M. and Husain, Z. (2011), 'Balancing the Present and the Future: A Study of Contraceptive Use in Calcutta's Slums', World Health and Population, vol. 12, No. 3, pp. 23-32.

Dyson, T. and Moore, M. (1983), 'On kinship structure, female autonomy, and demographic behavior in India', *Population and Development Review*, vol. 9, No. 1, pp. 35-60.

Ezeh, A. C. (1993), 'The Influence of Spouses over each others contraceptive change in developing countries', *International Family Planning Perspectives*, vol. 26, No. 3, pp. 100-109.

Filmer, D., Friedman, J. and Schady, N. (2008), *Development, Mode4rnization, and Son Preference in Fertility Decisions*, The World Bank, Policy Research Working Paper No. 4716.

Foster, A. D. and Rozenzweig, M. R. (1996), 'Technical change and human capital returns and investments evidence from the Green Revolution', *American Economic Review*, vol. 86, pp. 931-53.

Gibson, J. (2001), 'Literacy and Intrahousehold Externalities', *World Development*, vol. 29, No. 1, pp. 155-166.

Godley, J. (2001), 'Kinship Networks and Contraceptive Choice In Nang Rong, Thailand', *International Family Planning Perspectives*, 2001, vol. 27, No. 1, pp. 4-10 & 41.

Grady, W. R. (1996), 'Men's perceptions of their roles and responsibilities regarding sex, contraception, and childrearing'. *Family Planning Perspectives*, Vol. 28, No. 5, pp.221–226.

Green, S. E., Rich, T. A. and Nesman, E. G. (1985), 'Beyond individual literacy: the role of shared literacy for innovation in Guatemala', *Human Organization*, vol. 44, pp. 313-21.

Gubhaju, B. (2006), *Understanding women's contraceptive decision-making dynamics in Nepal*, Unpublished dissertation: The Pennsylvania State University.

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.

Guilmoto, C. Z and Rajan, S. I. (2001): 'Spatial Patterns of Fertility Transitions in Indian Districts', *Population and Development Review*, vol. 27, No. 4, pp. 713-718.

Heckman, J. (1979), 'Sample selection bias as a specification error', *Econometrica*, vol. 47, No. 1, pp. 153–61.

Iverson, V. and Palmer-Jones, R. (2008), 'Literacy Sharing, Assortative Mating, or What? Labour Market Advantages and Proximate Illiteracy Revisited', *Journal of Development Studies*, vol. 44, No. 6, pp. 797-838.

Iyer, S. (2002), 'Religion and the Decision to Use Contraception in India', *Journal for the Scientific Study of Religion,* vol. 41, No. 4, pp. 711-722.

James, K. S. and Nair, S. B. (2005), 'Accelerated Decline in Fertility in India since the 1980s: Trends among Hindus and Muslims', *Economic and Political Weekly*, Vol. 40 (Jan. 29, 2005), pp. 375-383.

Jayaraman, A., Mishra V., and 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,* vol. 35, No. 1, pp. 29-38.

Jayarani Reddy, P. (1984), 'Differential contraceptive use among the slum and non-slum dwellers: A study of Hyderabad city', *Perspectives & Issues*, vol.7, No. 2, pp.115-128.

Kabir, M., Amin, R., Ahmed, A. U., and Chowdhury, J. (1994), 'Factors Affecting Desired Family Size in Bangladesh', *Journal of Biosocial Science,* vol. 26, No. 3, pp. 369–75.

Kamal, N. (2000), 'The influence of husbands on contraceptive use by Bangladeshi women', *Health Policy and Planning*, vol. 15, No. 1, pp. 43-51.

Khan, M. I. and Bairagi, R. (2001), 'Contraceptive Use in Matlab with a Special Focus on Condoms: Socio-economic Correlates and Future Implications**',** *Journal of Health & Population in Developing Countries*, vol. 4, No. 2, pp. 16-22

Kulkarni, P. M. and Alagarajan, M. (2005), 'Population Growth, Fertility and Religion in India', *Economic and Political Weekly*, vol. 40 (Jan. 29, 2005), pp. 403-410.

Maddox, B. (2007), 'Worlds Apart? Ethnographic Reflections on "Effective Literacy" and Intrahousehold Externalities', *World Development*, vol. 35, No. 3, pp. 532-541.

Madhavan, S., Adams, A. and Simon, D. (2003), 'Women's Networks and the Social World Of Fertility Behavior', *International Family Planning Perspectives*, vol. 29, No. 2, pp. 58-68.

Mari Bhat, P. N. and Francis Xavier, A. J. (2005), 'Role of Religion in Fertility Decline: The Case of Indian Muslims', *Economic and Political Weekly*, vol. 40 (Jan. 29, 2005), pp. 385-402.

Martin, T. C. and Juarez, F. (1995), 'The Impact of Women's Education on Fertility in Latin American: Searching for Explanations', *International Family Planning Perspectives*, vol. 21, pp. 52-57 & 80.

Mbizvo, M. and Adamchak, D.J. (1991), 'Family Planning Knowledge, Attitudes and Practices of Men in Zimbabwe', *Studies in Family Planning*, vol. 22, No. 1, pp. 31-38.

Miller, B. D. (1981), *The Endangered Sex: Neglect of Female Children in Rural North India*. Ithaca: Cornell University Press.

Piotrow, P. T., Kincaid, D. L., Hindin, Lerrermaier, M. J., Kuseka, C. L., Silberman, I., T. *et al*. (1992), 'Changing men's attitudes and behaviour: the Zimbabwe Male Motivation Project', *Studies in Family Planning*, vol. 23, No. ???, pp. 365–375.

Roy, T.K., Sinha, R.K., Koenig, M., Mohanty, S.K., and Patel, S.K. (2008), 'Consistency and Predictive Ability of Fertility Preference Indicators: Longitudinal Evidence from Rural India', *International Perspectives on Sexual and Reproductive Health,* vol. 34, No. 3, pp. 138-145.

Saha, U. R. and Bairagi, R. (2008), 'Inconsistencies in the Relationship between Contraceptive Use and Fertility in Bangladesh', *International Family Planning Perspectives*, Vol. 33, No. 1, pp. 31-37.

Schoemaker, J. (2005), 'Contraceptive Use Among the Poor in Indonesia', *International Family Planning Perspectives*, vol. 31, No. 3, pp. 106-114.

Sen, A. (1993), 'Economics and the Family', in Patricia Uberoi (ed.), *Family, Kinship and Marriage in India*, New Delhi: Oxford University Press, pp. 452-63.

Shapiro, D. and Tambashe, B. O. (1994), 'The impact of women's educatioon and employment on contraceptive use and abortion in Kinshasha, Zaire', *Studies in Family Planning*, vol. 25, No. 2, pp. 96-110.

Singh, S., Darroch, J. E., Ashford, L. S. and 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. and Carter, M. (2005), 'Gender Relations and Reproductive Decision Making in Honduras', *International Family Planning Perspectives*, vol. 31, No. 3, pp. 131-139.

Speizer, I.S.(1999). Are husbands a barrier to women's family planning use? The case of Morocco, Social Biology, 46(1–2), 1–16. FORMAT

Valenti, P. (2002), *Should We Be Concerned About the Distribution of Literacy across Households? An Axiomatic Investigation*, Center for Analytic Economics (CAE), Working Paper, No. 02-15. Accessed on 24 April, 2011at http://www.arts.cornell.edu /econ/cae/Valenti_Literacy.pdf.

Vaughan, P. W., Regis, A. and St. Catherine, E. (2000), 'Effects on an Entertainment-Education Radio Soap Opera on Family Planning And HIV Prevention in St. Lucia', *International Family Planning Perspectives*, 2000, vol. 26, No. 4, pp. 148-157.

Visaria, L. (1994), 'Deficit of Women, Son Preference and Demographic Transitions in India', Paper presented at the International Symposium on Issues Related to Sex Preferences for Children in the Rapidly Changing Dynamics in Asia, (November) pp. 21–24, Seoul.

Watkins, S., Rutenber, N. and Wilkinson, D. (1997), Orderly theories, disorderly women, in G.W. Jones, R.M. Douglas, J.C. Caldwell and R.M. D'Sourza (ed) *The Continuing Demographic Transition*, New York, Oxford University Press, pp. 213-245.

Wegner, M. N., Landry E., Wilkinson, D. and Tzanis, J. (1998), 'Men as Partners in Reproductive Health: From Issues to Action', *International Family Planning Perspectives*, vol. 24, No. 1, (March), pp. 38-42.

Weinberger, M. B. (1987), 'The relationship between women's education and fertility: selected findings from the World Fertility Surveys', *International Family Planning Perspectives,* vol. 312, pp. 35-46.

APPENDIX

Table A.1: Profile of sample respondents

Sample Characteristics		India – Urban	India - Rural	India - Total
Whether partner is literate	Illiterate	39.06	48.78	46.13
	Literate	60.94	51.22	53.87
Geographical zone	North	21.83	22.04	21.98
	Central	33.84	38.76	37.40
	East	18.81	23.04	21.87
	West	11.89	7.78	8.91
	South	13.63	8.38	9.83
Socio Religious Identity	Muslim	25.67	13.15	16.57
	H-SC	22.58	19.43	20.29
	H-ST	4.43	13.48	11.01
	H-OBC	26.25	32.11	30.51
	H-FC	16.11	12.37	13.39
	Others	4.96	9.46	8.24
Marital duration (grouped) [excludes: married gauna not performed]	0-4	8.90	10.83	10.30
	5-9	14.78	16.40	15.96
	10-14	17.06	17.60	17.45
	15-19	18.41	18.42	18.42
	20-24	18.54	16.63	17.15
	25-29	14.65	13.40	13.74
	30+	7.66	6.73	6.98
Age 5-year groups	15-19	3.24	5.98	5.23
	20-24	11.81	14.26	13.59
	25-29	17.68	17.54	17.58
	30-34	18.07	17.94	17.98
	35-39	20.63	18.06	18.76
	40-44	15.65	14.76	15.00
	45-49	12.92	11.47	11.86
Wealth index	Poorest	5.99	33.89	26.28
	Poorer	12.92	29.43	24.93
	Middle	25.14	23.33	23.82
	Richer	36.17	10.83	17.73
	Richest	19.78	2.52	7.23
Recode of respondent occupation	Not Employed	64.31	40.56	47.04
	Employed	35.69	59.44	52.96

Sample Characteristics		India – Urban	India - Rural	India - Total
Recode of partners occupation	All others	11.15	50.44	39.73
	White collar jobs	7.40	3.68	4.69
	Sales	16.11	5.91	8.69
	Services	8.91	3.55	5.01
	Manual labour	56.43	36.43	41.88
Recode of no. of living sons	No son	17.11	19.19	18.62
	1 son	31.87	29.92	30.45
	2 sons	30.45	31.69	31.35
	More than 2 sons	20.57	19.21	19.58
Recode of no. of living daughters	No daughter	22.43	24.99	24.29
	1 daughter	34.08	32.59	33.00
	2 daughters	23.42	22.45	22.71
	More than 2 daughters	20.08	19.97	20.00
Frequency of listening to radio	Not at all	64.60	66.45	65.95
	Less than once a week	14.04	14.12	14.10
	At least once a week	10.17	9.53	9.70
	Almost every day	11.19	9.89	10.25

Table A2: Share of Proximate and Isolate Illiterates in different socio-economic groups

Correlate	Groups	Isolate Illiterate	Proximate Illiterate
Geographical zone	North	39.97	60.03
	Central	46.29	53.71
	East	50.23	49.77
	West	39.51	60.49
	South	51.48	48.52
Place of residence	Urban	39.06	60.94
	Rural	48.78	51.22
Marital duration (5 years)	0-4	41.08	58.92
	5-9	44.55	55.45
	10-14	46.42	53.58
	15-19	47.91	52.09
	20-24	47.78	52.22
	25-29	46.52	53.48
	30+	46.98	53.02
Age duration (5 years group)	15-19	45.15	54.85
	20-24	43.32	56.68
	25-29	46.46	53.54
	30-34	47.05	52.95
	35-39	46.64	53.36
	40-44	47.65	52.35
	45-49	45.21	54.79
Socio-religious identity	Muslim	52.99	47.01
	H-SC	47.50	52.50
	H-ST	58.87	41.13
	H-OBC	42.26	57.74
	H-FC	31.82	68.18
	Others	49.56	50.44
Wealth index score	Poorest	64.44	35.56
	Poorer	49.45	50.55
	Middle	41.93	58.07
	Richer	30.85	69.15
	Richest	19.47	80.53
Gender of last child	No child	44.54	55.46
	Male	45.46	54.54
	Female	46.24	53.76

Correlate	Groups	Isolate Illiterate	Proximate Illiterate
Partner's occupation	All others	52.28	47.72
	White collar jobs	15.62	84.38
	Sales	34.92	65.08
	Services	30.80	69.20
	Manual labour	47.88	52.12
Respondent's occupation	Not Employed	41.67	58.33
	Employed	50.10	49.90
Recode of no. of living sons	No son	45.99	54.01
	1 son	44.13	55.87
	2 sons	44.81	55.19
	More than 2 sons	51.52	48.48
Recode of no. of living daughters	No daughter	43.98	56.02
	1 daughter	44.52	55.48
	2 daughters	47.31	52.69
	More than 2 daughters	50.06	49.94

Table A.3: Results of Logit Model for Rural India by Selected Groups

Groups	Variable	Odd ratio	z	Prob >z	N	Pseudo R^2	χ^2
Geographical Zone	North	1.13	1.63	0.10	4496	0.24	1478.35
	South	1.02	0.18	0.86	1700	0.18	355.02
	East	1.04	0.52	0.60	4767	0.14	896.42
	West	1.49	2.88	0.00	1598	0.29	614.55
	Central	1.14	2.24	0.03	7888	0.17	1634.81
Socio religious community	Muslim	1.02	0.22	0.83	2777	0.14	449.55
	Hindu Scheduled Caste	1.07	0.86	0.39	3979	0.23	1269.41
	Hindu Scheduled Tribe	1.12	1.16	0.25	2780	0.21	797.69
	Hindu Forward class	0.93	-0.66	0.51	2525	0.20	711.74
	Other Socio Religious Groups	1.30	2.21	0.03	2027	0.25	654.32
	Hindu Other Backward Classes	1.20	2.86	0.00	6498	0.23	2038.25
Marital duration	0-4 years	1.47	1.97	0.05	2569	0.14	170.44
	5-9 years	1.28	2.69	0.01	3731	0.21	879.40
	10-14 years	1.16	1.75	0.08	3408	0.16	739.30
	15-19 years	0.91	-1.15	0.25	3462	0.12	573.00
	20-24 years	1.04	0.46	0.65	3264	0.15	675.71
	25-29 years	1.12	1.23	0.22	2663	0.13	487.99
	30+ years	1.09	0.67	0.51	1302	0.12	221.25
Wealth Index	Poorest	1.16	2.47	0.01	7109	0.17	1564.89
	Poorer	1.11	1.60	0.11	5904	0.22	1785.83
	Middle	0.97	-0.41	0.68	4744	0.23	1484.44
	Richer	1.05	0.45	0.66	2267	0.22	670.16
	Richest	1.33	1.06	0.29	562	0.16	121.11
Employment status of respondents	Employed	1.06	1.36	0.17	11965	0.21	3502.19
	Unemployed	1.14	2.29	0.02	8621	0.21	2394.61
Partner's occupation	Sales	1.02	0.10	0.92	1261	0.19	321.48
	White collar job	0.93	-0.27	0.79	746	0.21	213.07

Groups	Variable	Odd ratio	z	Prob >z	N	Pseudo R^2	χ^2
	Service sector	0.88	-0.63	0.53	715	0.20	197.91
	Manual labourer	1.20	3.09	0.00	7675	0.23	2339.85
	Other activities	1.06	1.18	0.24	10129	0.21	2896.32
Gender of last child	No child	1.40	0.79	0.43	1471	0.10	29.77
	Female child	1.10	1.90	0.06	9022	0.18	2151.73
	Male child	1.06	1.27	0.20	9901	0.16	2243.89