Mahila Samakhya: A Pathway to Delay Women's Marriage in India?

Pragya Bhuwania, Arnab Mukherji, and Hema Swaminathan

Center for Public Policy, IIM Bangalore

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1. Introduction

Women's age at marriage has been the focus of development strategies across the developing world and is considered crucial for realization of the Millennium Development Goals (Nour, 2006). Early marriage is widely recognized as a human rights violation as girls are denied access to education and economic opportunities, perpetuating the gendered nature of poverty (UNICEF, 2005; Raj, 2010; Otoo-Oyortey and Pobi, 2003). Evidence suggests that adolescent marriage and pregnancy may negatively impact both, women's reproductive health outcomes and child health outcomes (Finlay et al., 2011; Raj et al., 2010; Santhya et al., 2010).

Several studies emphasize the importance of gender relations and socio-cultural framework of the communities women live in for understanding marital outcomes (Dyson and Moore, 1983; Yabiku, 2006; Desai and Andrist, 2010). Women's empowerment can be a crucial pathway for altering gender norms within the household as well as in the broader community (Doss, 2013). In this paper, we study the impact of *Mahila Samakhya* (MS), a community-driven women's empowerment program, on age at first marriage of women in rural India.

MS aims at empowering marginalized women in rural India through a range of activities centered around self-help groups (*Sanghas*) that focus on education, livelihood development strategies, awareness, and self-reliance (*Mahila Samakhya 2014: A National Review*, 2014). MS was launched as part of National Policy on Education in 4 districts in 1989 and by the end of 2006 was implemented in 80 districts across 9 states in India. The program has continued to expand since then and continues to be functional after roll-out. In our analytical sample we use an additional set of 33 districts in which the program was rolled out after 2006. While the MS program's focus was on empowering women through education and collectivization, primarily through *Sanghas*, rather than delaying marriage, we believe controlling the age of marriage for women is an important indicator of empowerment.

Using MS roll-out data and the District Level Household Survey's third wave (DLHS-3 2007-08), our preliminary results suggest that the MS program does in fact impact the age at marriage. Furthermore, we explore if duration of exposure to the program has a differential impact on different age cohorts.

2. Literature Review

India has a low median age at marriage of women with substantial state variation (Dyson and Moore, 1983; International Institute for Population Sciences and Macro International, 2007). Dyson and Moore (1983) explain this regional variation across south and north India using differences in female autonomy or social status of women in the two regions. Chandrasekhar (2010) finds negative correlation between education attainment and age at marriage, however he draws our attention to the shortcoming of the study of not accounting for cultural and traditional norms due to lack of data. Desai and Andrist (2010) document how normative gender roles in the Indian society are intertwined with marital age and decision-making. They find a positive correlation between district level estimates of decision-making power of the women within the households, physical mobility of women, and absence of gender specific social systems such as the *Purdah* system on the one hand and age at marriage on the other. In addition, Baru and Dhaleta (2012) document an association between access to MS and outcomes such as improved sanitation, awareness of contagious diseases, and health-seeking behavior.

Past evaluations of MS, using state-specific primary data, suggest that MS is associated with gains in social, economic, and political empowerment of women (Janssens, 2010; Kandpal and Baylis, 2013; Kandpal et al., 2012). Janssens (2010) finds positive effects of MS participation on village level social capital, trust, and investment in community infrastructure in the state of Bihar. Kandpal and Baylis (2013) and Kandpal et al. (2012) study MS in Uttarakhand and establish diversified peer networks, better bargaining power, and empowerment among participants of the program.

We contribute to the current literature in two ways. Firstly, we study the impact of MS on women's age at marriage. To the best of our knowledge, this is the first paper to study MS at the national level. Secondly, we seek to establish a causal relationship between a women's empowerment program and their age at first marriage. The past studies on age at first marriage in

India have been able to establish only correlations with gender norms possibly due to lack of exogenous variation in empowerment and unobserved socio-cultural characteristics of household in determining age at first marriage of women. We exploit variation in roll-out of MS program at the district level and control for important sources of confounding to estimate its causal impact on age at marriage at individual level.

3. Data and Methodology

We use the nationally representative DLHS-3 survey 2007-08 data on ever and never married women aged 15-49 years. We pair this data with program implementation data collected from various district offices of MS, resulting in an analytic sample of 113 districts within the 10 states of India where MS was implemented selectively at district level. Owing to MS being a rural program, we restrict our sample to rural women. The survey instrument is rich enough to permit an analysis of a range of variables other than health, such as age at first marriage while controlling for confounders at multiple levels—individual, household, district, and state. Table 1 presents the summary statistics of women in our sample of MS districts.

We determine an individual's exposure to the program based on her district of residence and the age cohort she belongs to at the time of the interview. We expect the relationship between MS and age at marriage to depend on the age cohort of the women as they are at different points in time of their life course when they are exposed to the program. At one end, most women in the 45-49 age cohort (27-31 years of age in 1989) would have been married prior to the program rolled-out and thus, would be effectively unexposed to the program for marital outcomes. At the other end, women in the youngest cohort, 15-19 years of age residing in districts with MS, would have experienced the longest exposure to MS and thus, we expect to see strongest treatment effect in the youngest age cohort. Given that the exposure is measured at the district-by-age cohort level, our estimates constitute an intent-to-treat (ITT) analysis.

We attempt to account for potential endogenous MS roll-out at the district level by controlling for MS program design variables (e.g. caste, and poverty) that were used to target the roll-out. We further use state fixed effects to account for state level heterogeneity and, given that the program roll-out is at the district level, we use district level random effects to account for district level unobservable factors. With a cross-sectional dataset, we account for time varying

Table 1: Sample characteristics of women in MS districts

Characteristic	1989-2012 MS Districts
Education level (years)	3.751
Percent Ever Married	78.92
Percent Caste group	
General	21.77
Scheduled Caste (SC)	17.15
Scheduled Tribe (ST)	17.37
Other Backward Classes (OBC)	43.71
Percent Religious group	
Hindu	80.91
Muslim	14.13
Others(Jain, Buddhist, Christian, Sikh, Parsi)	4.96
Percent Wealth Quintiles	
Poorest (WI5)	25.38
Poor (WI4)	27.77
Middle (WI3)	23.13
Rich (WI2)	16.66
Richest (WI1)	7.06
Percent Landless	34.5
Percent Residence by State	
Andhra Pradesh	9.56
Assam	13.06
Bihar	20.94
Chhattisgarh	3.72
Gujarat	7.42
Jharkhand	9.67
Karnataka	9.68
Kerala	4.6
Uttar Pradesh	15.58
Uttarakhand	5.78

influences on the age of marriage, unrelated to MS, using (5 year age) cohort fixed effects. By looking at how the trends vary within cohorts across MS and non-MS covered districts, after controlling for a large number of women, household and district specific variables, we have a difference-in-difference style identification of our effects of the MS program. Finally, our outcome variable, age at marriage can be viewed as time to event variable and thus, we are interested in how access to MS alters the "hazard" rate for age at first marriage. We study all women aged 15-49 years, including those who are never-married, resulting in right censoring of

data in that not everyone has experienced the event of marriage; hence, we use the following Cox proportional hazard mixed effects model:

$$h(t|x) = h_0(t)exp\left\{\beta_0 + \sum_{k=2}^{7}\beta_{1k}Age_{ids} + \beta_2 MS_{ds} + \sum_{k=2}^{7}\theta_k Age_{ids}MS_{ds} + \vec{\lambda}\vec{X}_{ids} + \vec{\gamma}\vec{X}_{ds} + \eta_{ds} + \mu_s + \epsilon_{ids}\right\}$$

where, *t* measures years to marriage if not already occurred, $\vec{X}_{ids}$ is a vector of individual women and household level covariates such as education, caste, and religion, and $\vec{X}_{ds}$ represents district characteristics such as proportion of households in the poorest two quintiles and average level of education among women. District random effects are denoted by η_{ds}, state fixed effects by μ_s and ϵ_{ids} is the error term.

MS_{ds} is a binary variable that takes the value one for observations in district *d* in state *s* where MS was introduced in the district in 2007 or earlier (i.e. before the survey year); and zero for districts that are chosen for the program launch after 2007. We believe this presents a more comparable counterfactual group than all those districts that were never considered for the program. Age_{ids} represents *k* (seven) age cohorts and we consider the oldest age cohort of 45-49 years as our reference group. Our primary interest lies not in the difference between outcomes of oldest and youngest age cohort, but in comparison of this difference between women who had access to MS and those who did not. Once we difference out the generational differences within the treatment group with respect to our control group 2008-12, the remaining difference can be attributed to the functioning of Mahila Samakhya. This is estimated by θ_{15-19}, our difference-in-difference estimator. In other words, we hypothesize that age at marriage increased over time but increased more in treatment districts than in control districts and this difference is the causal impact estimate of the program. The key assumption we make here is that the generational gaps in the two groups would have been systematically similar in the absence of the program.

4. Preliminary Results

Table 2 presents how the hazard ratios, i.e. the risk of getting married within the next one year if unmarried, changes with access to MS on four analytical samples. Columns (1) and (2) provide

estimates for the entire sample of women aged 15-49 years whereas column (3) is for women aged 15-44 years. Column (4) presents estimates for a subsample of marginalized groups—Scheduled Caste and Scheduled Tribe (SC & ST) women; and in column (5) we restrict the sample to the poorest two wealth quintiles of SC and ST women.

Column (1) presents the results with no control variables. The treatment effect in terms of hazard ratio is 0.82 implying women in youngest cohort in treatment districts were 18 % less likely to get married within the next one year than those in control districts. However, these estimates do not control for any of the individual, household, district, and state characteristics that may confound the relationship between program exposure and marriage. In our regression framework, we now include individual and household variables such as woman's education, caste, religion, wealth index, and whether the household is landless. Inclusion of state fixed effects controls for state level confounders. We calculate district aggregates—proportion of Muslim population, proportion of SC, ST, and OBC (Other Backward Classes) households, proportion of households that are in the bottom two wealth quintiles, and the average education level of all women aged 15-49 years—using individual and household variables in the dataset.

Column (2) provides the revised estimates with control variables. The hazard ratio among the youngest women is 0.84 years as opposed to 0.82. With cultural norms even at district level likely to play an important role in determining marital outcomes in India, we include baseline district average age at marriage as a proxy for traditions regarding marital age. We do so by restricting our sample to women aged 15-44 years and use the oldest age cohort of 45-49 year old women to provide us with estimates for baseline age at marriage in a district. The omitted age category now is 40-44 cohort. This cohort, too, is appropriate as reference since the youngest woman in this group was 22 years old when the program was launched, and far higher than mean age of women in that age group and hence, would not have been impacted by the program.

The hazard ratio as shown in column (3) reduces to 0.87 but remains statistically significant, implying women aged 15-19 years in MS districts with respect to those in control districts are 13% less likely to get married within the next one year. We also notice that younger women have monotonically lower hazard of getting married than their older counterparts. This provides evidence that women's age at marriage increased in all districts but increased significantly more in program districts.

The hazard ratio is 0.79 and 0.77 among SC and ST women (column 4) and the poorest SC and ST women (column 5), respectively. This implies that treatment effect estimates are higher than that of the entire rural sample—21% and 23% as opposed to 13%. This provides evidence on the inclusive implementation of MS and that the outreach has been stronger among the most marginalised.

Going forward, we propose to examine whether the duration of exposure to MS has differential impact on various age cohorts. To capture this, we use the staggered roll out of the MS program to identify district cohorts that went on the program in 1989-1995 (24 districts), 1996-2002 (32 districts), 2003-2007 (24 districts), and 2008-2012 (33 districts).

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Table 2: Cox proportional Hazard Ratio Estimates for time to marriage in MS districts

	(1) Whole Sample	(2) Whole Sample	(3) 15-44 years	(4) SC & ST	(5) Poorest SC & ST
MS: Ever	1.03	1.09	1.00	1.05	1.03
	(0.07)	(0.07)	(0.05)	(0.07)	(0.08)
Age Cohort (years)					
15–19	0.30**	0.41**	0.38**	0.43**	0.45**
	(0.03)	(0.03)	(0.03)	(0.06)	(0.08)
20–24	0.57**	0.76**	0.68**	0.75**	0.80**
	(0.03)	(0.02)	(0.03)	(0.05)	(0.06)
25–29	0.80**	0.91**	0.86**	0.85**	0.88*
	(0.03)	(0.02)	(0.02)	(0.05)	(0.06)
30–34	0.93*	1.04	0.93**	1.00	0.96
	(0.03)	(0.02)	(0.03)	(0.05)	(0.06)
35–39	1.03	1.04	0.98	0.96	0.93
	(0.03)	(0.02)	(0.03)	(0.05)	(0.07)
40–44	1.08**	1.04			
	(0.03)	(0.03)			
MS Ever: 15–19	0.82**	0.84**	0.87**	0.79**	0.77**
	(0.04)	(0.03)	(0.03)	(0.07)	(0.08)
MS Ever: 20–24	0.95	0.92**	1.01	0.96	0.94
	(0.03)	(0.03)	(0.03)	(0.05)	(0.07)
MS Ever: 25–29	0.95	1.01	1.03	1.02	1.02
	(0.03)	(0.03)	(0.03)	(0.05)	(0.07)
MS Ever: 30–34	0.98	0.99	1.07*	0.99	1.04
	(0.03)	(0.03)	(0.03)	(0.05)	(0.07)
MS Ever: 35–39	0.95	1.03	1.03	1.05	1.10
	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
MS Ever: 40–44	0.94	1.01			
	(0.03)	(0.03)			
Control Variables	No	Yes	Yes	Yes	Yes
Observations	131,960	131,593	122,649	42,575	27,975

Notes:
1) Robust standard errors in parentheses
2) ** p<0.01, * p<0.05
3) MS Ever: 15-19 indicates the interaction between the MS Ever binary variable and the 15-19 year age cohort binary variable.
4) Control variables used: at individual/household level—woman's education, caste, religion, land ownership, household wealth index; at district level—Muslim population proportion, SC, ST, and OBC population proportion, population proportion in lowest two wealth quintiles, average women's education level, and average baseline age at marriage; at state level—state fixed effects.