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Maternal Early Marriage and Cognitive Skills Development: An Intergenerational Analysis*

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Abstract: We document the intergenerational consequences of early marriage using a recently collected household survey data on mothers and their adolescent children sampled from some of the poorest districts of Bangladesh. Bangladesh has one of the highest rates of child marriages in the world. We test the extent to which low level of numeracy among children is explained by early marriage of their mothers. Information on physical changes experienced during the adolescence is used to predict the age at first marriage of mothers. We use test scores on identical numeracy questions to document the adverse effect of early marriage on mothers and their children. In our data, the level of basic numeracy skill is very low for both groups. We address the endogeneity problem by using information on age at menarche as an instrument for early age of marriage. 2SLS and instrumental variable Probit estimates confirm a causal negative effect of mother's early marriage on own schooling as well as children's cognitive outcomes. The effect is larger in case of daughters. We find evidence of both direct and indirect effect of mother's early marriage on children. The indirect effect primarily operates by lowering years of schooling which in turn lowers cognitive skills of mothers.

Key words: child marriage; learning outcomes; gender inequality; poverty; Bangladesh.
JEL classification: I26, I28, J12, J16, O12

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1. Introduction

South Asia has the highest incidence of girls marrying during childhood or early adolescence (Raj, McDougal, and Rusch 2012). This practice has adverse consequences for the health and well-being of women and is often perceived as one of the reasons for the observed gender inequality in a range of pre- and post-marriage outcomes. Parents withdrawing girls from school to get married is one key factor which drives female drop-out rate in upper secondary grades in rural areas in South Asia and Sub-saharan Africa (Mahmud and Amin 2006; Nguyen and Wodon, 2014; Wodon, Nguyen and Tsimpo, 2016). According to one estimate, each year of marriage postponement leads to a gain of 0.30 years of extra schooling in Bangladesh (Field and Ambrus 2008). Similar delay in early marriage is found to be associated with an increase of half a year of education in Sub-Saharan Africa and nearly one third of a year of education in South West Asia (Delprato et al. 2015).

Bangladesh has one of the highest rates of child marriages in the world, the prevalence being particularly high in rural areas[1]. According to recent estimates, 74% of the girls aged below 18 years are married off[2], while 39% of girls aged below 15 are married off as well in Bangladesh. Over 20% girls who are married off before reaching 15 years become mothers of 3 children or more before reaching 24 years (UNICEF 2014). The reductions in girl child marriage in Bangladesh have occurred largely by delaying marriage among younger but not older adolescent girls. Consequently, prevalence of marriage among 16 and 17-year-old girls has increased (Raj et al. 2012). These patterns suggest little overall change in the incidence of early marriage despite improved access to schooling and paid work for Bangladeshi women. A confluence of traditional social attitudes and customs and household poverty is likely to responsible (Gage 2013; Human Rights Watch 2015).

Early age at marriage is likely to have intergenerational consequences by adversely affecting human capital accumulation formation of children. Across countries there is a strong link between parental educational attainment and subsequent education attainment of their children. This relationship is mediated by a host of intertwined factors such as income, home learning environment and aspiration. If mothers who married at a younger age have completed less years of schooling (relative to mothers who married later and completed more years of schooling), their children are also likely to go on to have lower schooling. Additionally early marriage can limit mother's agency within the household and negatively affect human capital investment decisions of children within the household. Evidence indicates that secondary education plays a protective role across minor age at marriage categories in Bangladesh (Raj et al 2014). Mothers marrying later can therefore exert their agency, particularly to help daughters complete secondary education. There is growing evidence in the public health and social science literature that young maternal age is associated with adverse birth and child outcomes. Children of older mothers can also be disadvantaged at birth and in childhood in various ways. These include poor

[1]According to a national survey conducted in 2013 by Plan International and ICDDR,B, the rate of child marriage among all women aged 20-24 years was 54% in urban areas, compared to 71% in rural areas. See http://planinternational.org/files/Asia/publications/national-survey-on-child-marriage-by-plan-bangladesh-and-icddr-b

[2] Bangladesh is a predominantly patrilineal and patrilocal society with females leaving their homes to join the household of the groom.

nutritional status and low schooling (Fall et al 2015), greater risks of fetal death and anaemia (DeVienne, Creveuil, and Dreyfus, 2009), behavioral problems (Chang et al. (2014), infant mortality (Alam, 2000; Raj et al 2010; Restrepo-Mendez et al., 2011), low birthweight (Borja and Adair, 2003), educational and psychosocial outcomes (Fergusson and Woodward 1999) and verbal abilities in early childhood (Morinis et al 2013).[3] The adverse effect can be also large during adolescence, and particularly for girls, as this period involves acquiring critical life skills and education which in turn can help delay marriage timing among children.

The objective of this study is to document the consequences of early marriage on cognitive development of children, beyond merely own schooling completed and cognitive skills attained. The level of learning among schooled children is very low in rural Bangladesh (Asadullah and Chaudhury 2015) – children learn little in school irrespective of the school type attended or how far they progress in the schooling cycle. Similar findings of low quality of student learning are rife in other South Asian countries such as India and Pakistan (Dundar et al 2014). The low level of learning could be due to poor school quality or/and socio-economic disadvantages.[4] Uneducated mothers have lower test scores and spend less time on educational activities at home therefore failing to help their children with school work (Andrabi, Das, and Khawaja, 2012). The more illiterate the mother, the less likely it is that there is reading material at home (Banerje et al 2013). Apart from affecting parental human capital and empowerment, early marriage can also harm child outcomes by reduced maternal aspiration (Maertens 2013).

In this paper, we focus on mother's age at marriage as a specific family background factor that can adversely affect children's learning outcomes. We do so using a recently collected data set that has matched information on learning outcomes of mothers and their adolescent children. The intergenerational impact of the effect of maternal early marriage is explored directly as well as indirectly. In particular, we test the extent to which low level of learning among adolescents is explained by mother's early marriage. To capture the causal effect, information on physical changes experienced during adolescence is used to predict the age of marriage of the mother.[5]

Beyond causally identifying the effect of mother's age at marriage on children's educational outcomes, our study extends the existing literature in several ways. First, we study the impact of maternal marriage timing in a context where schooling-learning gradient is shown to be relatively flat for girls so that the potential for learning gains through increased maternal schooling is large. Second, the unique nature of our data allows us to simultaneously investigate the impact on cognitive skills of mothers themselves. This way, we are able to explain an important pathway through which maternal early marriage affects children's learning achievement. In this sense, our paper is different from two earlier studies, Field and Ambrus

[3]For a review of evidence on the physical and mental health consequences of child marriage, see Raj (2010). For review of the literature on maternal age and adverse perinatal outcome, see Carolan and Frankowska (2011). For a review of studies on adolescent pregnancy and fetal development, see Scholl and Hediger (1993). For a meta-analysis of the evidence on the effect for maternal age on infant outcomes, see (Gibbs et al. 2012).

[4] For a recent review of the literature on educational production function, see Evans and Popova (2015).

[5] We are aware of only one other study, Sekhri and Debnath (2014), which documents the intergenerational effects of early age marriages of girls on the human capital of their children in India using similar empirical framework. The main finding of this paper is that a delay of one year in the age at marriage of the mother increases the probability of passing the most difficult arithmetic and reading test by 3.5 percentage points.

(2008)[6] and Sekhri and Debnath (2014), where the authors do not have data on identical literacy and numeracy tests administered both to mothers and their adolescent children. In doing so, we present intergenerational influences as an explanation for low level of student learning in South Asia and contribute to the growing evidence that mother's education attainment helps to boost children's cognitive skills in developing and developed countries (Rosenzweig and Wolpin 1994; Currie and Moretti, 2003; Brown, McIntosh and Taylor 2011; Andrabi, Das, and Khawaja, 2012; Banerje, Berry, and Shotland, 2013)[7].

We find that early age marriages not only reduce mother's educational attainment, but it also lowers their numeracy skills. Majority (69%) of the mothers in our sample married before the age of 18 years and has an average level of schooling of 2 years. After adjustment for confounders, 2SLS and instrumental variable Probit estimates confirm a causal effect of mother's early marriage on own cognitive development. More importantly, maternal early marriage adversely impacts education outcomes of children, particularly daughters. One year of delay in marriage increases mother's schooling by 0.36 year and the probability of acquiring basic numeracy skill by 2 percent. The impact on the probability of daughters acquiring the same numeracy skill is 1.5 percent. We find evidence of both direct and indirect effect of mother's early marriage on children. The indirect effect operates by lowering years of schooling which in turn lowers cognitive skills of mothers. However other mechanisms through which the direct effect of maternal age at marriage is mediated are unclear. Although mothers' say in children's welfare is found to be positively associated with children's test score, it per se doesn't explain away the estimated effect of maternal age at marriage on children's cognitive development. Evidence therefore suggests that the effect is primarily mediated through a reduction in maternal cognitive skills instead of diminished agency or say in within household decisions.

Rest of the paper is organized as follows. Section 2 describes the methodology. Section 3 describes the sample and data. Section 4 presents the main results. We conclude in section 5.

2. Methodology

Early age at marriage can reduce mother's educational attainment and literacy adversely impacting the education outcomes of their children. However the relationship between early marriage and female empowerment can be endogenous for several reasons. More literate females can better protect their rights and resist parental pressure to marry young. On the other hand, more empowered females can delay marriage and have higher level of schooling for themselves and their children.[8] In the absence of a randomized intervention (e.g., an NGO implemented social mobilization campaign at the community level that shifted marriage age among mothers), we address the endogeneity problem by using information on age at menarche to construct

[6] Field and Ambrus rely on data from the relatively prosperous Matlab thana of Chandpur district. Their survey data was collected in 1996; the level of education and economic participation among adult women in the mid-1990s was very low which in turn significantly contributed to early marriage. In contrast, we rely on survey data collected nearly 20 years later (i.e. 2012) by when rural poverty has declined and considerable improvements in female schooling have occurred alongside increase in work participation.

[7] For the UK, Brown, McIntosh and Taylor (2011) find that test scores of mothers, taken at age 7, positively impact the corresponding test scores of their offspring measured at a similar age.

[8] For a review of the literature on cause of child marriage, see Raj (2010).

instrument for maternal early marriage. This approach is similar to that followed by Field and Ambrus (2008) and facilitates estimation of the causal effect of early marriage.[9]

We examine the impact separately on mothers and their children. The former analysis additionally takes into account the effect of mother's birth cohort as well as geographic advantages at birth. The latter analysis is complicated by the fact that children's learning outcome is shaped by school specific factors as well as household resources. In particular, early marriage need not have an adverse impact on children. 'Better marriage prospects' (i.e., marrying into a richer household) of young brides may compensate and improve children's educational outcomes by way of resource provision (Sekhri and Debnath 2014). Consequently, the effect of early age of marriage of girls on their children can be ambiguous. Therefore our regression model includes detailed control for the household's socioeconomic status (e.g. access to electricity, household assets and so on) and distance to nearest primary and secondary schools.

3. Data

Data used in this paper comes from a survey designed by the authors on behalf of BRAC, one of the most dynamic NGOs in Bangladesh which is also providing services to marginalized children in 11 other developing countries. The fieldwork was completed by October 2012 where sample respondents came from 30 sub-districts belonging to 19 districts. As such our data set has greater regional representation compared to Field and Ambrus (2008) who relied on survey data from one sub-district in Bangladesh. The survey forms the baseline for BRAC's Adolescent Development Program (ADP) as part of which BRAC later set up youth clubs to impart important life skills to adolescents in the community. Four villages in each programme sub-district were randomly selected to receive the ADP intervention (and 4 villages were randomly selected to remain as control villages). Clubs in programme area were set up towards the end of 2012 once we had completed the data collection work. In total, 4,320 adolescents between the age of 11 and 16 years were selected from programme and comparison areas following a systematic random sampling method. Since the primary programme beneficiaries are adolescent girls, we oversampled girls.

The baseline survey gathered detailed data on adolescents' knowledge of and attitude towards a wide range of gender and marriage related issues. We also conducted a short numeracy test using items that were used by Asadullah and Chaudhury (2015). In addition to interviewing sample respondents, our household survey also interviewed mothers of all adolescent children and gathered very detailed data on their cognitive ability (measured in terms of same numeracy test given to children and in addition testing basic Bangla and English reading ability). In addition, we have collected data on mother's marital history and participation in household decision making. The analysis of this paper draws upon the baseline survey as the follow-up survey following the intervention has yet to be conducted.

Descriptive statistics are presented in **Appendix Table 1**. Majority of the married women in our sample (69%) were married before they were 18 years old and the mean age at menarche was

[9] Also see Sekhri and Debnath (2014) who use nationally representative data from India on test scores in an instrumental variable framework to identify the effects of early age marriages of girls on the human capital of their children.

12.9 years. There's a clear negative correlation between maternal early age marriage and schooling/cognitive outcomes. Mothers marrying before 18 has on average 1.8 years of schooling against 2.5 years among those who married by 18. Moreover, they have 7 percentage points lower probability of achieving minimum numeracy skills (measured by the ability to correctly answer 3 out of 4 primary grade mathematics question). Similar gaps are evident when we look at literacy scores (measured in terms of the ability to read 2 sentences in Bangla and English). In contrast, children's schooling status (current enrolment and/or years of schooling completed) doesn't vary by mother's marital background – on average 80% are in school and have completed 5.3 years of schooling. However children raised by mothers who've married young have 4 percentage points lower probability of achieving minimum numeracy skills. The next section causally revisits these correlations based on estimates obtained from regression models.

4. Main Results

4.1 Early marriage and mother's human capital

Table 1 reports estimates of the impact of age at marriage on schooling and literacy outcomes of sample mothers (of adolescent children). To formally examine concerns about 'weak instruments', we ran mother level regression of age at marriage on age at menarche (first stage regression not shown). The timing of menarche can have low predictive power partly because factors that delay menarche (e.g. heavy physical work during adolescence; residing in hot climate zones) are also correlated with household poverty (Field and Ambrus 2008).We don't have information on mother's pre-marital health status or economic status. However there is significant geographical variation in our sample as many households belong to the semi-arid north-western part of Bangladesh and we know mother's place of birth. This allows us to tackle location specific determinants of menarche. Therefore we estimated two versions of the regression. The first model controlled for mother's age and place of birth fixed effect. The coefficient of 0.52 is highly statistically significant and much higher compared to that reported in Field and Ambrus (2008), and the F statistic is 196.70. The second model simultaneously controlled for birth cohort as well as place of birth fixed effects. The coefficient on menarche variable reduces in size to 0.50 but remains highly statistically significant with an F statistic of 182.7.

Table 1: OLS, 2SLS and IV-probit estimates of the effect of age at marriage on mother's schooling completed and test scores

	OLS/ PROBIT	2SLS/ IV-PROBIT	OLS/ PROBIT	2SLS/ IV-PROBIT	OLS/ PROBIT	2SLS/ IV-PROBIT
Dependent variable: Years of schooling completed						
Age at marriage	0.172	0.368	0.184	0.351	0.191	0.366
	(10.38)**	(5.24)**	(11.00)**	(4.85)**	(11.22)**	(4.97)**
R-squared	0.07	0.02	0.11	0.08	0.11	0.08
Wald test of exogeneity	--	--	--	--	--	--
Wu-Hausman F test (p-value)	--	0.00	--	0.00	--	0.00
Durbin-Wu-Hausman chi-sq test (p-value)	--	0.00	--	0.00	--	0.00
Dependent variable: Can read 2 sentences in Bengali						
Age at marriage	0.091	0.119	0.095	0.116	0.098	0.028
	(10.67)**	(3.46)**	(10.54)**	(3.05)**	(10.62)**	(2.90)**
Pseudo R-squared	0.05		0.08		0.09	
Wald test of exogeneity	--	0.13	--	0.23	--	0.25
Wu-Hausman F test (p-value)	--	--	--	--	--	--
Durbin-Wu-Hausman chi-sq test (p-value)	--	--	--	--	--	--
Dependent variable: Can read 2 sentences in English						
Age at marriage	0.10	0.105	0.113	0.135	0.118	0.014
	(8.63)**	(2.16)*	(9.19)**	(2.58)**	(9.24)**	(2.40)*
Pseudo R-squared	0.06		0.11		0.11	0.07
Wald test of exogeneity	--	0.60	--	0.68	--	0.69
Wu-Hausman F test (p-value)	--	--	--	--	--	--
Durbin-Wu-Hausman chi-sq test (p-value)	--	--	--	--	--	--
Dependent variable: Numeracy score (0-4)						
Age at marriage	0.046	-0.004	0.052	-0.016	0.053	-0.016
	(6.08)**	(0.12)	(6.84)**	(0.48)	(6.84)**	(0.47)
R-squared	0.02	0.02	0.09	0.08	0.10	0.09
Wald test of exogeneity	--	--	--	--	--	--
Wu-Hausman F test (p-value)	--	0.68	--	0.43	--	0.43
Durbin-Wu-Hausman chi-sq test (p-value)	--	0.68	--	0.43	--	0.44
Dependent variable: Numeracy attained (1 if correctly answer at least 3 items; 0 otherwise)						
Age at marriage	.042	-.005	.051	-.022	0.052	--
	(5.28)**	(0.18)	(6.84)**	(0.68)	(6.70)**	--
Pseudo R-squared	0.02		0.04		0.05	
Wald test of exogeneity	--	0.10	--	0.09	--	--
Wu-Hausman F test (p-value)	--	--	--	--	--	--
Durbin-Wu-Hausman chi-sq test (p-value)	--	--	--	--	--	--
Birth cohort fixed effects	No	No	Yes	Yes	Yes	Yes
Birth place fixed effects	No	No	No	No	Yes	Yes
F-test on excluded instrument	--	207.31	--	192.6	--	182.6

Note: (1) All regressions control for mother's age. (2) **, * and + indicate statistical significant at 1%, 5% and 10% respectively.

Turning to the estimated effect of mother's age at marriage variable, a number of results follow. First, the impact on years of schooling completed ranges between 0.17 (OLS model) and 0.36 (2SLS model with natal district and birth cohort fixed effects). This is consistent with Field and Ambrus (2008) who found that a delay in marriage by an additional year increases education by

0.22 years.[10] The estimated coefficient is statistically significant in all models and Wald/Wu-Hausman test rejects exogeneity of the variable "age at marriage". Second, delay in marriage systematically leads to a gain in literacy skill (ability to read two sentences in Bangla or English). Again this is in line with other studies in the literature.[11] However Wald/Wu-Hausman test fails to reject exogeneity of the variable "age at marriage". When converted into marginal effects, Probit model estimate (based on birth cohort and place fixed effects) suggest 2.3 and 1.1 percentage gain in the probability of acquiring Bangla and English literacy skill. Third, in case of numeracy skill (ability to correctly answer 4 simple mathematics questions), the effect is always positive and statistically significant in the OLS model. While the coefficient remains positively signed, it becomes insignificant in the 2SLS model. Probit model estimates based on the binary equivalent dependent variable (measuring minimum competency in terms of the ability to correctly answer any 3 items) yields similar result. The estimated coefficient of 0.052 implies 2 percentage gains in the probability of acquiring minimum numeracy skill following one year delay in marriage.[12] Fourth, IV estimates are larger than OLS. This is consistent with Sekhri and Debnath (2014) and Field and Ambrus (2008). For Bangladesh, Field and Ambrus find IV estimate to be larger in case of cognitive outcomes than OLS though the difference in case of highest grade attained was small, IV being somewhat smaller.

These differences in maternal cognitive skills by age at marriage can have important implications for children's development. Evidence indicates that children whose home lacks an environment that nurtures learning tend to have lower learning levels (Banerje at al 2013). This is most likely to be true in case of children of less educated parents. Since early marriage lowers the level and quality of maternal human capital, this can in turn adversely affect the level of human capital acquired by children. We examine this possibility in the next section.

4.2 Early marriage and children's human capital

Main results are presented in **Table 2** (full specification is reported in Appendix Table 2). Key patterns are as follows. First, there is a consistently positive and statistically significant impact of age at marriage on children's numeracy scores irrespective of whether we look at OLS/Probit estimates or 2SLS/ IV-Probit estimates. This confirms the deleterious effect of early marriage on children's cognitive development in a low literacy environment. Second, the effect is bigger when we control for endogeneity. The coefficient on age at marriage is three times bigger in 2SLS/IV-Probit estimates models compared to their respective OLS/Probit counterparts. This suggests that the naïve estimates of early marriage are if anything, downward biased.[13] However,

[10] To be precise, Fields and Ambrus estimate is based on the sub-sample of women who enrolled in school at the age of 9. When we re-estimate the impact for this sub-sample (N=1487), the OLS and IV estimates are respectively 0.18 and 0.39 year (with natal district and birth cohort fixed effects).

[11]For India, Sekhri and Debnath (2014) find that a delay of one year in the age at marriage of the mother increases the probability of being able to do the most challenging arithmetic and reading tasks on the administered test by 3.5 percentage points.

[12] 55 percent mothers in our sample have basic numeracy skill; see Appendix Table 1.

[13] The naïve estimate can be downward biased if later marriage leads to a move to financially poorer households in rural Bangladesh. If so, non-natal family resources fall in age at marriage and this negatively affects human capital of children (Sekhri and Debnath 2014). We do not have pre-marriage data on husbands and wives. Therefore we can't control for the positive resource effect of early marriage. And it is the lack of such controls that can cause a potential downward bias in our estimates.

Wald/Wu-Hausman test of exogeneity of the variable "age at marriage" could not be rejected in any case suggesting that OLS/Probit estimates are consistent and efficient. The marginal effect equivalent of the estimated coefficient size of 0.028 in Probit model is 0.01 implying a 1 percentage gain in the probability of acquiring minimum numeracy skill.

Third, the schooling-learning profile is relatively flat. Years spent in school don't lead to significant gain in numeracy skills which could be because of poor quality of rural schools in Bangladesh. Whilst the coefficients on higher grades (e.g. 3-9) are positively signed and progressively larger, the rate of change is small. Among other factors, there is a systematic gender penalty in learning.[14] In this setting, being raised by a mother who married early imposes an additionally learning penalty.

Table 2: OLS, 2SLS, Probit and IV-probit estimates of the impact of age at marriage on children's numeracy scores

	Dependent variable: **Numeracy score (0-4)**		Dependent variable: **Numeracy competency (1 if correctly answer at least 3 items; 0 otherwise)**	
	OLS	**2SLS**	**PROBIT**	**IV-PROBIT**
Mother's age at marriage	0.017	0.058	0.028	0.07
	(2.65)**	(1.99)*	(3.51)**	(1.98)*
Wald test of exogeneity	-	-	-	0.22
Wu-Hausman F test (p-value)	-	0.14	-	-
Durbin-Wu-Hausman chi-sq test (p-value)	-	0.14	-	-
F-test on excluded instrument	-	219.79	-	-
Adjusted/Pseudo R-squared/Wald chi2	0.18	0.18	0.15	695.68

Note: (1) All regressions control for mother's age. (2) **, * and + indicate statistical significant at 1%, 5% and 10% respectively.

4.3 Potential pathways

Overall our results confirm the earlier finding by Field and Ambrus (2008), and expands upon it -- early age marriages of mothers not only reduces mother's educational attainment, it also lowers her literacy and numeracy skills. Together these adversely impact the education outcomes of their children and the impact is larger on daughters. However, very few studies have formally looked into pathways through which maternal age influences child outcomes. Maternal early marriage can impact children's education indirectly (by undermining investment in health or by changing aspirations about children's future lives) or directly (by altering spending on education or limiting capacity to provide input in educational production).[15]We do not have detailed data on adolescents' health outcomes to test for the health pathway. Neither do we have information on intra-household food distribution and household spending on adolescent health and education. Therefore we cannot directly test for example, whether children born to mothers married as minors are more under-fed and under-nourished relative to children born to women marrying at 18 or later.

[14] These patterns are consistent with previous analysis of student learning in Bangladesh (e.g. see Asadullah and Chaudhury 2015).

[15]For a review of the associations between maternal and child undernutrition with human capital and adult health in low-income and middle-income countries, see Victora et al (2008). The authors also present evidence from five prospective cohort studies from Brazil, Guatemala, India, the Philippines, and South Africa on the relationship between a variety of maternal and child undernutrition and adult outcomes such as height, schooling, income, offspring birthweight and so on.

Nonetheless, we test for *three* specific channels that can explain the observed effect of age at marriage on children's numeracy skills in our data. First, mothers marrying early may internalize the social norm and aspire to marry off their daughters early as well, and hence invest less in their human capital. We do not have data on mother's perceived ideal age of marriage. However as an indirect test of the aspiration hypothesis, we re-estimate the regressions by gender in **Table 3 (**full specification is reported in Appendix Table 3). *Interestingly enough, in all models, the impact of age at marriage is never significant for boys.* This result is similar to Maertens (2013) who find that perceptions of the ideal age of marriage significantly constrain the education that parents aspire to have only for their daughters. This highlights the importance of social norms regarding the ideal age of marriage in the children's educational outcomes.

Table 3: OLS, 2SLS, Probit and IV-probit estimates of the impact of age at marriage on children's numeracy scores by gender

	Dependent variable: **Numeracy score (0-4)**				Dependent variable: **Numeracy competency (1 if correctly answer at least 3 items; 0 otherwise)**			
	OLS		**2SLS**		**PROBIT**		**IV-PROBIT**	
	Girl	**Boy**	**Girl**	**Boy**	**Girl**	**Boy**	**Girl**	**Boy**
Mother's age at marriage	0.027	-0.012	0.09	-0.075	0.04	-0.008	0.10	-0.037
	(3.41)**	(1.11)	(2.66)**	(1.29)	(4.27)**	(0.46)	(2.69)**	(0.41)
Wald test of exogeneity	-	-	-	-	-	-	0.10	0.74
Wu-Hausman F test (p-value)	-	-	0.05	0.26	-	-	-	-
Durbin-Wu-Hausman chi-sq test (p-value)	-	-	0.05	0.25	-	-	-	-
F-test on excluded instrument	-	-	181.86	40.47	-	-	-	-
Adjusted/Pseudo R-squared/Wald chi2	0.17	0.20	0.15	0.08	0.13	0.18	495.21	180.35

Second, mothers marrying late can be expected to be better educated and/or more literate and hence more able to serve as home tutors. To this end, we estimate models reported in Table 2 by additionally controlling for mother's years of schooling. Results are presented in **Table 4**. Mother's schooling positively and significantly impacts children's numeracy score (Table 4, panel A). However even after controlling for this, the effect of age of maternal marriage remains significant, particularly in 2SLS/IV-Probit models. In an alternative specification, we replace years of schooling by three specific measures of maternal cognitive skills. Similar to the earlier specification, mother's own numeracy score enters the regression with a positively signed and significant coefficient (Table 4, panel B). However the estimated coefficient on "age at marriage" is insignificant irrespective of whether we use OLS or 2SLS model.[16] Overall the results therefore suggest that maternal early marriage lowers children's numeracy largely by lowering literacy and numeracy among mothers (as also documented in section 4.1).

[16] We also estimated the IV-Tobit. While the estimates are significant, a wald test of exogeneity couldn't be rejected at 5% level (a p-value of 0.10) suggesting that instrumental variable estimate is inefficient.

Table 4: Effect of marriage age on children's numeracy scores additionally controlling for mother's literacy and education

Panel A: Control for mother's schooling	Dependent variable: **Numeracy score (0-4)**			Dependent variable: **Numeracy competency (1 if correctly answer at least 3 items; 0 otherwise)**	
	OLS	**2SLS**	**IV-TOBIT**	**PROBIT**	**IV-PROBIT**
Mother's age at marriage	0.013	0.045	0.054	0.025	0.064
	(1.91)+	(1.44)	(1.66)+	(3.05)**	(1.71)+
Mother's schooling	0.029	0.029	0.024	0.027	0.021
	(4.50)**	(3.52)**	(2.81)**	(3.20)**	(2.01)*
Constant	1.597	0.535	0.727	-2.011	-2.873
	(1.06)	(0.33)	(0.42)	(1.09)	(1.45)
N	4178	4178	4178	4178	4178
Wald test of exogeneity	-	-	0.18	-	0.28
Wu-Hausman F test (p-value)	-	0.44	-	-	-
Durbin-Wu-Hausman chi-sq test (p-value)	-	0.44	-	-	-
Adjusted/Pseudo R-squared/Wald chi2	0.20	0.17	874.02	0.15	807.02
Panel B: Control for mother's test score	**Numeracy score (0-4)**			**Numeracy competency (1 if correctly answer at least 3 items; 0 otherwise)**	
	OLS	**2SLS**	**IV-TOBIT**	**PROBIT**	**IV-PROBIT**
Mother's age at marriage	0.007	0.05	0.058	0.019	0.068
	(1.06)	(1.64)	(1.82)+	(2.26)*	(1.84)+
Mother's numeracy score	0.432	0.418	0.431	0.477	0.46
	(11.75)**	(11.01)**	(10.87)**	(10.27)**	(9.48)**
Mother's literacy: bangla	0.106	0.114	0.067	0.095	0.055
	(1.89)+	(1.83)+	(1.05)	(1.23)	(0.67)
Mother's literacy: english	0.112	0.056	0.074	0.256	0.212
	(1.31)	(0.63)	(0.78)	(1.95)+	(1.57)
Constant	1.105	-0.123	0.066	-2.718	-3.756
	(0.75)	(0.08)	(0.04)	(1.45)	(1.89)+
N	4178	4178	4178	4178	4178
Wald test of exogeneity	-	-	0.09	-	0.17
Wu-Hausman F test (p-value)	-	0.26	-	-	-
Durbin-Wu-Hausman chi-sq test (p-value)	-	0.26	-	-	-
Adjusted/Pseudo R-squared/Wald chi2	0.23	0.19	1189.1	0.17	804.5

Lastly, the third pathway through which early marriage can harm children is reduced agency as mothers marrying late can be expected to have more bargaining power within the household. Young brides tend to have less control over resources in their husband's families and experience more domestic violence (Jensen and Thornton, 2003). This in turn can lower human capital of the children through intra-household resource allocations. Part of the return to maternal education in Table 4 may be mediating through this channel – mothers marrying young have less education which diminishes autonomy in household decision making.[17] To this end, we re-estimated Table 4 by additionally controlling for two indictors that proxy for mother's agency and autonomy within marriage – "say in household expenditure" and "say in decision making regarding children's health" (see **Table 5**). "Say in child health" enters the educational production function with a statistically significant and positive coefficient. Irrespective of

[17] For a similar analysis on child health, see Guilbert (2013). The author uses Senegalese Demographic and Health Surveys to explore three channels through which early marriage reduces a mother's ability to influence child mortality: (a) the harmful physical consequences of early pregnancy, (b) disruption to maternal schooling, and (c) reduced bargaining power within marriage.

whether we control for mother's schooling (Panel A) or literacy and numeracy (Panel B), the estimated coefficient on mother's age at marriage variable is close to zero.

In order to establish the relative contribution of mother's human capital and agency, we re-produce the results without any control for the former (table 5; Panel C). The size of the estimated coefficient on "mother's say in child health" is identical irrespective of whether we control for maternal schooling or not. This finding is similar to Andrabi, Das, and Khawaja (2012) who do not find any evidence that mother's education affects child outcomes through increased bargaining power within the household in Pakistan. It probably captures the fact that at a very low level of schooling, the marginal gains in schooling caused by delayed marriage is not through improved bargaining power within marriage.[18] The finding could be also driven by the possibility that without changes in the sociocultural conditions that constrain women's actions, education per se doesn't enhance their agency (Murphy-Graham and Graciela 2015).

[18] For recent research that do not find conclusive evidence of the impact of education on women's empowerment, also see Friedman, Kremer, Miguel, and Thornton (2011). The authors study the impact of a randomized girls' merit scholarship incentive program in Kenya. They find that young women in program schools were less likely to accept domestic violence. However, this did not translate into greater perceived community participation or voting intentions.

Table 5: Effect of marriage age on children's numeracy scores additionally controlling for mother's autonomy

Panel A: with control for mother's schooling	Dependent variable: **Numeracy score (0-4)**		Dependent variable: **Numeracy competency (1 if correctly answer at least 3 items; 0 otherwise)**	
	OLS	**2SLS**	**PROBIT**	**IV-PROBIT**
Mother's age at marriage	0.007	0.054	0.005	0.072
	(1.07)	(1.74)+	(2.24)*	(1.95)+
Mother's say in household expenditure	-0.064	-0.057	-0.036	-0.129
	(1.46)	(1.28)	(2.22)*	(2.24)*
Mother's say in child health	0.393	0.397	0.138	0.426
	(8.34)**	(7.66)**	(7.85)**	(6.43)**
Mother's schooling	0.026	0.024	0.007	0.017
	(4.07)**	(2.90)**	(2.93)**	(1.6)
Constant	1.411	0.217	-0.352	-3.345
	(0.95)	(0.13)	(0.63)	(1.70)+
Wald test of exogeneity	-	-	-	0.14
Wu-Hausman F test (p-value)	-	0.19	-	-
Durbin-Wu-Hausman chi-sq test (p-value)	-	0.19	-	-
Adjusted/Pseudo R-squared/Wald chi2	0.21	0.10	0.18	776.1
Panel B: with control for mother's test scores	**Numeracy score (0-4)**		**Numeracy competency (1 if correctly answer at least 3 items; 0 otherwise)**	
	OLS	**2SLS**	**PROBIT**	**IV-PROBIT**
Mother's age at marriage	0.002	0.056	0.004	0.074
	(0.38)	(1.89)+	(1.57)	(2.04)*
Mother's say in household expenditure	-0.093	-0.083	-0.047	-0.16
	(2.15)*	(1.88)+	(2.90)**	(2.77)**
Mother's say in child health	0.362	0.365	0.128	0.394
	(7.80)**	(7.23)**	(7.36)**	(6.00)**
Mother's numeracy score	0.41	0.393	0.141	0.442
	(11.18)**	(10.41)**	(10.28)**	(9.04)**
Mother's literacy: bangla	0.081	0.076	0.017	0.017
	(1.46)	(1.25)	(0.79)	(0.21)
Mother's literacy: english	0.111	0.047	0.043	0.213
	(1.31)	(0.53)	(1.36)	(1.57)
Constant	0.987	-0.319	-0.501	-4.083
	(0.68)	(0.22)	(0.92)	(2.07)*
Wald test of exogeneity	-	-	-	0.09
Wu-Hausman F test (p-value)	-	0.11	-	-
Durbin-Wu-Hausman chi-sq test (p-value)	-	0.11	-	-
Adjusted/Pseudo R-squared/Wald chi2	0.24	0.20	0.21	846.11
Panel C: without control for mother's schooling	**Numeracy score (0-4)**		**Numeracy competency (1 if correctly answer at least 3 items; 0 otherwise)**	
	OLS	**2SLS**	**PROBIT**	**IV-PROBIT**
Mother's age at marriage	0.011	0.062	0.007	0.076
	(1.71)+	(2.14)*	(2.72)**	(2.20)*
Mother's say in household expenditure	-0.051	-0.045	-0.033	-0.121
	(1.17)	(1.01)	(2.02)*	(2.12)*
Mother's say in child health	0.394	0.395	0.139	0.423
	(8.34)**	(7.62)**	(7.86)**	(6.42)**
Constant	1.505	0.192	-0.326	-3.248
	(1.01)	(0.12)	(0.59)	(1.66)+
Wald test of exogeneity	-	-	-	0.11
Wu-Hausman F test (p-value)	-	0.13	-	-
Durbin-Wu-Hausman chi-sq test (p-value)	-	0.13	-	-
Adjusted/Pseudo R-squared/Wald chi2	0.20	0.18	0.19	757.5

5. Conclusion

The persistence of early marriage in Bangladesh, despite decreasing poverty, and most importantly, decades of education interventions targeted to keeping rural girls in school (e.g., Female Secondary Stipend Program, the pioneering conditional cash transfer program, to incentivize parents to keep their girls enrolled in secondary school), is perplexing (Asadullah and Wahhaj 2016). In this paper we have revisited the empirical evidence on the impact of early marriage of girls on educational outcomes of their children. We make a unique contribution to the literature on the intergenerational transmission of cognitive skills from mothers to children by simultaneously studying the impact on cognitive outcomes of mothers and their children. Previous studies have shown that women's age at marriage affects their own educational attainment (Field and Ambrus, 2008) and mother's education influences the education outcomes of children (Currie and Moretti, 2003; Rosenzweig and Wolpin 1994). We first document impact on own human capital noting that delay in age at marriage leads to higher completed years of schooling and language skills (in Bangla and English). Together these are shown to adversely impact the education outcomes of their children and the negative impact is larger and significant for their daughters -- a one-year delay in woman's marriage increases the probability that her daughters will be able to perform lower level numeracy tasks by 1.4%. This is a significant gain considering the fact that only 65% sample girls have basic numeracy skills. But we additionally demonstrate that controlling for child, mother and household characteristics, the effect of mother's age at marriage on children's educational outcomes is positive and significant. We find evidence that women's age at marriage improves the human capital of their children over and above the effect of the family resources. Neither do we find any evidence that the results are confounded by factors specific to birth districts of mothers.

In conclusion, girls who are raised by mothers who married young not only learn systematically less in school, they also face greater risk of dropping out early. Clearly the social costs of early marriage are significant. Our results suggest that policies that increase the average marriage age among mothers will not only help close the gender gap in literacy, it will also have a longer term impact on the society by improving human capital of the next generation of mothers. This is particularly significant considering that fact that the schooling-learning profile is flat in so many parts of rural South Asia– the level of cognitive skills and literacy is low even among schooled children. While the flat learning profile is likely to be primarily caused by poor quality of education service delivery in rural areas, the custom of early marriage makes it even harder to improve learning outcomes. The norm of early marriage therefore traps generation of mothers in low learning. This is one reason why in countries like Bangladesh, progress in girls' schooling has not succeeded in closing gender gap in learning.

Many consider girls' schooling as the most effective means of reducing girl child marriage (Myers and Harvey, 2011; Brown, 2012). Yet in South Asian countries such as Bangladesh, substantial improvements in access to schooling for girls have not translated into equivalent reductions in child marriage (Raj et al 2014; Asadullah and Wahhaj 2016). Therefore, policymakers have yet another reason to prioritize programs that ends child marriage in a generation – above and beyond traditional programs like Conditional Cash Transfers or relying on indirect interventions such as improved access to schooling. Delaying marriage will not only

improve women's physical and mental well-being in poor households, this would also help mothers play an effective role in facilitating children's cognitive development at home. In this context, NGO led initiatives can play an important role. These initiatives directly target girls at risk of early marriage and empower them through awareness and confidence building measures (Warner, Stoebenau and Glinski 2014).[19] Available evidence suggests that the approach is effective in delaying early marriage (Bandiera et al 2014). More research on the performance of these programs is necessary for scaling up efforts to eliminate the practice of child marriage.

[19] Emerging evidence from other developing countries also highlight the importance of social channels (such as mass media and interpersonal communication exposure) in shifting community perception on the ideal marriage age and endorsing daughters' rights to marriage choice (e.g. see Gage 2013).

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Appendix Table 1: Summary Statistics

	Full sample		Mother married before 18		Mother married on/after 18	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Mother's sample						
Current age	39.43	7.63	39.05	7.81	40.29	7.12
Non-Muslim	0.15	0.35	0.12	0.32	0.21	0.41
Age at first marriage	15.96	2.73	14.56	1.66	19.18	1.84
Age at menarche	12.91	0.96	12.81	0.90	13.13	1.06
Age at first pregnancy	18.17	3.00	16.95	2.25	20.99	2.60
Years of schooling completed	1.97	2.98	1.76	2.80	2.46	3.33
Can read 2 sentences in Bangla	0.18	0.39	0.15	0.36	0.25	0.44
Can read two sentences in English	0.06	0.24	0.05	0.21	0.09	0.29
Numeracy/Maths score (0-4)	2.69	1.33	2.63	1.33	2.81	1.31
Numeracy attained (any 3 maths answer correct)	0.56	0.50	0.54	0.50	0.61	0.49
Children's sample (11-16 years old)						
Age	13.44	1.53	13.45	1.52	13.40	1.55
Girl child	0.75	0.43	0.78	0.41	0.68	0.47
non-Muslim	0.15	0.35	0.12	0.32	0.21	0.41
Numeracy/Maths score (0-4)	3.01	1.25	2.97	1.26	3.09	1.23
Numeracy attained (any 3 maths answer correct)	0.69	0.46	0.68	0.47	0.72	0.45
years of schooling completed	5.32	2.18	5.31	2.16	5.34	2.23
Currently in school	0.81	0.40	0.81	0.40	0.81	0.40
Absent from school b/c of illness	0.09	0.28	0.09	0.28	0.09	0.29
Household size	5.64	1.75	5.61	1.72	5.71	1.82
Household head female	0.07	0.25	0.06	0.24	0.08	0.27
Distance to primary school (in logs)	0.08	0.29	0.08	0.30	0.07	0.28
Distance to secondary school (in logs)	0.48	0.56	0.48	0.56	0.47	0.55
Household has electricity	0.47	0.50	0.47	0.50	0.48	0.50
Household asset value (in logs)	12.63	1.84	12.68	1.84	12.51	1.83
N	4178		2915		1263	

Appendix Table 2: OLS, 2SLS, Probit and IV-probit estimates of the impact of age at marriage on children's numeracy scores

	Dependent variable: **Numeracy score (0-4)**		Dependent variable: **Numeracy competency (1 if correctly answer at least 3 items; 0 otherwise)**	
	OLS	**2SLS**	**PROBIT**	**IV-PROBIT**
Age	-0.03	0.002	0.106	0.138
	(0.14)	(0.01)	(0.39)	(0.51)
Age, squared	0.003	0.002	-0.001	-0.002
	(0.4)	(0.28)	(0.12)	(0.22)
Girl child	-0.465	-0.43	-0.546	-0.505
	(11.45)**	(9.06)**	(10.00)**	(7.73)**
Schooling completed : grade 1	-0.626	-0.614	-0.604	-0.588
	(3.42)**	(3.34)**	(2.61)**	(2.54)*
Schooling completed : grade 2	-0.171	-0.18	-0.112	-0.121
	(1.28)	(1.34)	(0.72)	(0.78)
Schooling completed : grade 3	0.274	0.267	0.311	0.302
	(2.15)*	(2.09)*	(2.12)*	(2.06)*
Schooling completed : grade 4	0.522	0.525	0.573	0.573
	(4.30)**	(4.32)**	(4.09)**	(4.09)**
Schooling completed : grade 5	0.876	0.876	0.879	0.873
	(7.32)**	(7.30)**	(6.33)**	(6.28)**
Schooling completed : grade 6	1.075	1.071	1.134	1.122
	(8.50)**	(8.45)**	(7.59)**	(7.49)**
Schooling completed : grade 7	1.028	1.023	1.138	1.124
	(7.94)**	(7.89)**	(7.42)**	(7.31)**
Schooling completed : grade 8	1.103	1.092	1.236	1.216
	(8.23)**	(8.11)**	(7.66)**	(7.48)**
Schooling completed : grade 9	1.204	1.186	1.446	1.418
	(8.46)**	(8.29)**	(8.14)**	(7.88)**
Non-Muslim household	-0.136	-0.184	-0.158	-0.206
	(2.67)**	(3.02)**	(2.54)*	(2.82)**
Household head female	-0.091	-0.107	-0.134	-0.148
	(1.29)	(1.49)	(1.53)	(1.68)+
Child currently enrolled in school	0.409	0.406	0.428	0.423
	(7.37)**	(7.31)**	(6.45)**	(6.36)**
Child absent from school	-0.104	-0.11	-0.154	-0.159
	(1.68)+	(1.76)+	(2.00)*	(2.07)*
Mother's age at marriage	0.017	0.058	0.028	0.07
	(2.65)**	(1.99)*	(3.51)**	(1.98)*
Mother's age	0.003	0.002	0.004	0.003
	(1.05)	(0.61)	(1.21)	(0.82)
Distance to nearest primary school	-0.057	-0.052	-0.042	-0.037
	(0.93)	(0.85)	(0.57)	(0.49)
Distance to nearest secondary school	0.013	0.015	0.052	0.054
	(0.4)	(0.46)	(1.3)	(1.34)
Household size	-0.015	-0.018	-0.021	-0.023
	(1.47)	(1.66)+	(1.65)+	(1.80)+
Household has electricity	0.042	0.038	0.055	0.049
	(1.15)	(1.02)	(1.2)	(1.08)
Household asset value (in logs)	-0.004	-0.002	0.003	0.004
	(0.39)	(0.21)	(0.22)	(0.36)
Constant	1.845	0.959	-1.899	0.955
	(1.23)	(0.59)	(1.04)	(88.33)**

Note: (1) All regressions control for mother's age. (2) **, * and + indicate statistical significant at 1%, 5% and 10% respectively.

Appendix Table 3: OLS, 2SLS, Probit and IV-probit estimates of the impact of age at marriage on children's numeracy scores by gender

	Dependent variable: **Numeracy score (0-4)**				Dependent variable: **Numeracy competency (1 if correctly answer at least 3 items; 0 otherwise)**			
	OLS		**2SLS**		**PROBIT**		**IV-PROBIT**	
	Girl	**Boy**	**Girl**	**Boy**	**Girl**	**Boy**	**Girl**	**Boy**
Age	-0.104	0.167	-0.085	0.022	-0.1	0.845	-0.551	-1.887
	(0.39)	(0.43)	(0.32)	(0.05)	(0.32)	(1.39)	(0.27)	(1.79)+
Age, squared	0.006	-0.004	0.006	0.001	0.007	-0.029	0.015	-0.027
	(0.64)	(0.3)	(0.6)	(0.06)	(0.57)	(1.29)	(0.69)	(1.1)
Schooling completed : grade 1	-0.627	-0.513	-0.628	-0.569	-0.681	-0.522	-0.672	-0.942
	(2.62)**	(1.92)+	(2.61)**	(2.08)*	(2.20)*	(1.45)	(2.19)*	(1.3)
Schooling completed : grade 2	-0.005	-0.368	-0.012	-0.332	-0.006	-0.287	-0.014	-0.27
	(0.03)	(1.97)*	(0.06)	(1.75)+	(0.03)	(1.17)	(0.09)	(1.07)
Schooling completed : grade 3	0.411	0.116	0.404	0.139	0.317	0.326	0.305	0.335
	(2.39)*	(0.66)	(2.34)*	(0.78)	(1.62)	(1.38)	(0.12)	(0.74)
Schooling completed : grade 4	0.674	0.343	0.675	0.331	0.585	0.612	-0.043	0.604
	(4.11)**	(2.00)*	(4.09)**	(1.92)+	(3.13)**	(2.65)**	(3.11)**	(2.60)**
Schooling completed : grade 5	1.029	0.688	1.026	0.687	0.885	0.946	-0.026	0.118
	(6.36)**	(4.05)**	(6.30)**	(4.03)**	(4.79)**	(4.05)**	(0.07)	(0.26)
Schooling completed : grade 6	1.278	0.746	1.27	0.753	1.142	1.241	1.118	0.152
	(7.55)**	(4.09)**	(7.45)**	(4.12)**	(5.88)**	(4.63)**	(5.74)**	(0.31)
Schooling completed : grade 7	1.211	0.764	1.216	0.806	1.143	1.241	-0.135	0.855
	(7.03)**	(4.08)**	(7.01)**	(4.20)**	(5.78)**	(4.44)**	(0.36)	(1.69)+
Schooling completed : grade 8	1.288	0.762	1.258	0.74	1.225	1.348	0.464	-0.158
	(7.29)**	(3.79)**	(7.05)**	(3.65)**	(5.99)**	(4.30)**	(5.70)**	(4.20)**
Schooling completed : grade 9	1.387	0.874	1.348	0.867	1.426	1.598	0.56	1.589
	(7.50)**	(3.99)**	(7.20)**	(3.94)**	(6.51)**	(4.26)**	(1.38)	(0.15)
Non-Muslim household	-0.181	0.02	-0.252	0.103	-0.199	-0.025	1.151	1.232
	(2.99)**	(0.22)	(3.53)**	(0.88)	(2.84)**	(0.18)	(3.34)**	(5.19)**
Household head female	-0.152	0.153	-0.17	0.187	-0.215	0.273	-0.228	0.678
	(1.78)+	(1.25)	(1.97)*	(1.47)	(2.21)*	(1.25)	(2.35)*	(1.3)
Child currently enrolled in school	0.414	0.422	0.41	0.424	0.435	0.377	0.426	0.376
	(6.20)**	(4.32)**	(6.10)**	(4.31)**	(5.73)**	(2.62)**	(0.27)	(0.23)
Child absent from school	-0.087	-0.139	-0.103	-0.148	-0.145	-0.207	-0.158	-0.21
	(1.14)	(1.4)	(1.33)	(1.48)	(1.65)+	(1.28)	(1.80)+	(0.37)
Mother's age at marriage	0.027	-0.012	0.09	-0.075	0.04	-0.008	0.10	-0.037
	(3.41)**	(1.11)	(2.66)**	(1.29)	(4.27)**	(0.46)	(2.69)**	(0.41)
Mother's age	0.004	-0.001	0.002	0.002	0.005	-0.003	0.019	0.029
	(1.28)	(0.16)	(0.78)	(0.32)	(1.57)	(0.44)	(2.96)**	(0.26)
Distance to nearest primary school	-0.056	-0.061	-0.056	-0.1	-0.024	-0.06	0.104	-0.078
	(0.77)	(0.57)	(0.77)	(0.87)	(0.29)	(0.35)	(0.28)	(0.43)
Distance to nearest secondary school	0.017	0.024	0.022	0.027	0.042	0.125	-0.081	-0.005
	(0.42)	(0.42)	(0.56)	(0.46)	(0.92)	(1.32)	(1.02)	(1.33)
Household size	-0.029	0.027	-0.032	0.031	-0.038	0.049	0.057	0.051
	(2.26)*	(1.55)	(2.47)*	(1.73)+	(2.65)**	(1.62)	(2.06)*	(1.66)+
Household has electricity	0.018	0.106	0.011	0.112	0.029	0.156	0.09	0.118
	(0.41)	(1.68)+	(0.25)	(1.76)+	(0.56)	(1.53)	(0.42)	(1.55)
Household asset value (in logs)	0.005	-0.042	0.008	-0.045	0.015	-0.066	0.017	-0.04
	(0.43)	(2.20)*	(0.66)	(2.32)*	(1.07)	(2.05)*	(2.34)*	(2.08)*
Constant	1.444	1.587	0.322	3.521	-1.381	-5.499	0.947	0.963
	(0.8)	(0.61)	(0.17)	(1.11)	(0.66)	(1.35)	(1.64)	(0.92)
N	3134	1044	3134	1044	3134	1044	3134	1044