The role of private schooling on children learning outcomes and prevalence of female mathematical anxiety in India

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Learning outcomes among children play a major role in shaping up future individual earnings, development and hence economic growth. Along with the demand side factors like parental income and education, supply side factors are important as well. In the view of increasing preference of private schooling in India, this paper assesses its impact on learning outcomes of children aged 8-11 years. Despite earlier attempts to study this, the existing literature does not control for confounding unobservable factors that may affect learning factors. By applying instrument variable regressions through credible instruments that would control for the unobservable characteristics, the paper finds positive and significant impact of private schooling on learning outcomes among children in rural India. It also finds some evidence of gender difference among children from public schools in terms of learning outcomes and also finds evidence of prevalence of mathematical anxiety among females.

Key words: Learning outcomes, schooling, IHDS, mathematical anxiety.

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Introduction

There is growing evidence which shows learning outcomes are important in shaping up individual earnings, development and hence economic growth (Hanushek and Woessemann, 2008). For example, it is found that improving performance in mathematics at the end of the high school is associated with higher annual earnings (Mulligan, 1999; Lazear, 2003). As opposed to educational indicators like school enrolment or years of schooling, it is often argued that learning outcomes or cognitive skills allow for a more accurate picture of the learning experience and hence become critical for enhancing income, productivity and life evaluations.

There are numerous factors that can affect cognitive abilities or learning outcomes in a child. For example, household headship in India can play an important role as children from female headed households are found to perform similar or better than those from male-headed households (Singh et al. 2013). Apart from such contributions from parents, or family, one significant factor may also be formal schooling (Hanushek, 2005). Likewise it can be argued that indicators of school quality like reduced teacher absenteeism, smaller classroom size and favourable teacher-student ratio among others can have substantial positive consequences on learning outcomes (Singh, 2015). In this regard, quality of education may also be related to systematic differences across various types of schools (government and private in particular), which may in turn affect these learning outcomes.

This paper draws its motivation from this aspect and attempts to examine the association of learning outcomes among rural children with private schooling at an all India level. The question becomes all the more important especially given the rapid increase in the number of private schools in the primary education sphere in developing countries and substantial increases in enrolment thereof (Baum et. al, 2014). With India boasting of the

largest school education systems in the world and the growing evidence of a significant increase of share of enrolments in private schools, especially in rural India (from approximately 18% in 2006 to over 30% in 2014), studying variations in learning experiences arising due to school quality becomes even more important (District Information System for Education, 2014; ASER 2014). In terms of literature, a number of studies have attempted to find the relationship between private schooling and learning outcomes among children in the context of India. Using nationally representative Indian Human Development Survey (IHDS) data for 2004-05, Chudgar and Quin (2012) find positive relationship between the two after controlling for other related factors. However no significant correlation is found when multivariate analysis based on data balanced using propensity score matching technique is used. Goyal and Pandey (2009) explore systematic differences between private and public school going children in Uttar Pradesh and Madhya Pradesh and find students studying in private schools to obtain higher academic scores. Using another dataset called the Annual Status of Education Report (ASER) covering over 330,000 households, French and Kingdon (2010) find positive impact of private schooling on cognitive skills for children in the 6-14 years age group. Azam et al. (2015) found similar or insignificant effect in parts of Orissa and Rajasthan, whereas Goyal (2009) found significant and positive impact on mathematics and language test in eastern Orissa.

The most prominent limitation recognised by all these studies has been the inability to control for unobservable characteristics, which may affect both learning outcomes among children and the decision to attend a private school. For example, attitude or motivation of the parents can play a role in affecting a child's cognitive abilities and can also be a key to the decision to send their child to a private school. To overcome the problem of unobservable factors, Muralidharan and Sundararaman (2015) conducted an experimental study of randomised allocation of vouchers which would fund a child to go to a private school of their

choice. They find no difference in test scores suggesting that the systematic difference of the learning outcomes between children going to a private and public school can largely be attributed to unobservable/omitted variables. However, it should be noted experimental designs have limitations especially in terms of external validity where the causal inferences cannot be generalised to other situations and other people (Angrist and Pischke, 2010). Further, ethical issues of allocating the voucher to one child and denying the other may not be trivial.

In a non-experimental set up, Desai et al. (2008) attempt to control for the omitted variables using the IHDS data for 2004-05 through the usage of theoretically motivated instruments. These instruments are expected to be correlated with the decision to enrol a child in private school but may not be expected to be independently related with educational outcomes. They use availability of private school in the village, desirability of public schools and social networks among the parents that is important in gaining entrance in private schools. We argue that these variables may not act as suitable instruments because of which the estimates may turn out to be biased. Social networks among parents may be seen as an outcome of motivation or attitude which we argue can affect private school enrolment as well as academic outcomes. Desirability of public schools proxied by English medium instruction and presence of a cook for the school meal may also affect learning outcomes independently. For example, it is highly likely that schools with these facilities would have better teachers (this variable is not controlled for in the regression) and that may affect learning outcomes among the students. Further, IHDS dataset contains information about only one school in each of the villages surveyed and does not cover information on other schools. Hence it may happen that the school information may not actually correspond to the particular school that a child goes to. It may also happen that the school surveyed is a government school despite presence of private schools in the village which may indicate that there are no private schools

in a village whereas there actually might be. Hence there might be problems if availability of private schools is used as instrument.

This paper uses the IHDS data collected in the latest round (2011-12) and attempts to examine children attendance in private schools and its relationship with educational outcomes. The nobility of the paper lies in controlling for unobservable characteristics using a set of district level instruments which do not come from the IHDS dataset. More specifically, we use ratio of the number of private schools to public schools in the district[1] in the year 2010-11 along with the availability of private school in the village (as used in Desai et al. 2008). The theoretical and econometric validity of the instruments are discussed in section 5. It is found that attendance in private school play a significant role in improving learning outcomes for reading and mathematics and to some extent in writing skills as well for children. As an extension, the paper also attempts to find the gender difference in learning outcomes across private and public schools. We find no significant difference in learning outcomes for children studying in private schools apart from mathematics, where males are found to perform better. However male children from public schools are found to perform better than girls not only in mathematics but also in reading indicating that prevalence of gender difference among children attending government schools. It also points out to the prevalence of higher anxiety over mathematics among female students.

The structure of the paper is as follows. Section 2 gives a broad literature review on learning outcomes and their determinants. Section 3 talk about the data and the variable used and section 4 presents the regression strategy. The next section discusses the results from the

[1] Given some differences in district codes between IHDS and DISE data due to changes in the names of some districts or formation of new districts, the following changes were made to DISE data before merging with IHDS:-
District code 1101 (*Sikkim),* 1201 *(Arunachal),* 1301 *(Nagaland),* 1401 *(Manipur),* 1501 *(Mizoram),* 1601 *(Tripura),* 1701 *(Meghalaya)* and 2601 (*Dadra and Nagar Haveli)* have been changed to 1100, 1200, 1300, 1400, 1500, 1600, 1700 and 2600, respectively.
Also, code 971 (*Bhadohi)* has been replaced with code 968 (*Sant Ravidas Nagar)* due to name change and data from *Perambalur* district in DISE is used for code 3317 (*Ariyalur)* as the latter was a part of *Perambalur* district till 2007.

empirical exercise and the final section gives the inferences drawn from the results and then concludes.

Determinants of learning outcomes

Several scholars have studied the different determinants that can affect learning outcomes among children. Lucas and Mbiti (2014) find positive impact on learning outcomes for students attending elite public secondary schools in Kenya. Metzler and Woessman (2010) document teacher knowledge to be an important factor for higher student test performance in Peru. Burde and Linden (2013) find that construction of new schools in rural Afghanistan led to large positive impact on test scores for both, boys and girls. Similar results were obtained in rural Burkina Faso as well (Kazianga et al. 2013). In terms of household and children characteristics, Black et al. (2005) examine the effects of family size and birth order on children education attainments and found both to be negatively associated.

In India too, several studies exist. Household headship seems to matter as literature finds children from female headed households to perform evenly or better in terms of schooling and learning outcomes in India especially rural areas (Chudgar, 2011; Singh et al. 2013). Similarly, Unisa and Datta (2005) find children of households that are headed by females have greater chances of attending school while Kambhampati and Pal (2001) find the impact of mother's literacy levels to be significant in determining the chances of their daughters to receive education. Dongre and Tewary (2014) study the effects of private tutoring on learning outcomes among children in rural India and find the relationship to be significantly positive. Azam (2015) also finds similar results. Gangopadhyay and Sarkar (2014) examine the determinants of expenditure on education received by the child, which has further implications on the child's learning abilities. They find wealth of the household, educational attainment of the parents (especially the household-head) and distance to the

nearest school or college to play a significant role. While school libraries are not found to be associated with better educational outcomes (Borkum, He and Linden, 2012), the introduction of computers have significantly positive effects on learning outcomes (Banerjee et al. 2007; Linden, 2008).

Data and Variables

This paper uses the second round of a nationally representative dataset from IHDS which is conducted jointly by National Council of Applied Economic Research (NCAER) and University of Maryland. This round (surveyed in the year 2011-12) covered over 42,000 households which consisted of over 200,000 individuals from more than 1500 villages and 971 urban neighbourhoods across various districts in India. The survey conducted covered topics in education, health, economic wellbeing, social status, marriage practices, gender relations, and various other domains. These surveys were conducted out with the help of a voluntary organisation named PRATHAM which works in the field of primary education and also carries out similar tests for their Annual Status of Education Report (ASER). While the results of those tests are also based on a large sample of children, IHDS data captures the background and characteristics of the households in more detail.

Outcome variables

It should be noted that short tests capturing learning outcomes on reading, math and writing for children aged 8-11 years were also administered in the survey. These simple tests were conducted in 14 languages (where children could choose to write the test in a language that they chose) and each test was successfully administered to over 11,500 children (over 8000 children belonged to rural households) at their homes. These test scores serve as the outcome variables of the paper.

The three outcome variables (namely reading, math and writing scores) deal with discrete results relating to ordered abilities, as opposed to marks obtained which is more prevalent form of assessment. The outcome variable relating to reading skills is coded into five categories ranging from 0 to 4. The categories include those (i) who cannot read at all (ii) who can only read letters/ alphabets (iii) who can read words but not sentences or paragraphs (iv) who can read short paragraphs but not a full page or story and (v) who can read a full story. Math skills are coded into four categories ranging from 0 to 3. The categories include those (i) who are not able to recognise numbers, (ii) who can recognise numbers but not do any arithmetic, (iii) who can do a basic subtraction problem but not division and those (iv) who can do a division problem. Writing skills are coded into three categories ranging from 0 to 2. The categories include those (i) who cannot write (ii) who can write a simple sentence but make one or two mistakes and those (iii) who can write a simple sentence without any mistakes

Explanatory variables

The main explanatory variable of interest is the type of school that the child attends and has been categorised based on enrolment in government schools and private school. The variable is taken as dichotomous and children attending government schools are taken as the reference group. This enables us to compare them with children from private schools.

Based on the determinants of learning outcomes and education of children (particularly in the Indian context), this study uses support of prior literature (Desai et. al., 2008; Chudgar, 2009; Azam, Kingdon and Wu, 2014; Azam, 2015; Singh et al., 2013) to include a number of controls pertaining to economic and social characteristics of both the individuals (that is children) and the household. Children who attend private schools might differ systematically from those who attend government schools on various dimensions. Observable characteristics such as sex and age related to the individual child, and a group

variable that includes both religion and caste have been included in the analysis. Factors relating to the household that may affect the wellbeing, learning outcomes and cognitive abilities of the child, such as locality (whether urban or rural and which state the child belongs to), quality of the house (whether *kutcha* or *pucca*)[2], electricity access (number of hours), toilet facilities, yearly per capita household expenditure (using natural log), ownership of television and refrigerator; number of meals consumed in the household and education level of the household head are taken.

Further, factors that are direct inputs towards learning such as number of hours spent-at school, doing homework and attending private tuitions; fees paid towards private tuition and whether the child uses computer are controlled for. School related factor such as the grade that child studies in is is also included. Lastly, a variable capturing short term illness (fever) that may temporarily affect the cognitive abilities of the child is controlled for. Children having major morbidity problems such as mental illnesses, cancer, paralysis and heart diseases, and children who are not attending any schools have been dropped from the analysis due to less observations and the high impact it might have on the dependent variable (learning outcomes/ test scores).

Regression Strategy

To estimate the Average Treatment Effect (ATE) of private schooling on the learning outcomes of the children, a simple regression of the latter on the former would yield unbiased estimates, after controlling for all the other underlying factors that may affect learning outcomes. The measure of impact would be determined by the regression coefficient of the variable, attendance of the child in private school. However, as discussed earlier, attendance in private school cannot be assumed to be a random process and would depend on unobservable characteristics like attitude or motivation along with the observable

[2]*Pucca* houses are those in which roof, walls, and floors are made of good quality materials while *Kutcha* houses are made of poor quality materials such as mud or thatch.

characteristics like that of the child or economic condition of the household. A simple regression discussed above may lead to the problem of the omitted variable bias or endogeneity (Greene 2012, Angrist and Pischke 2009). To get unbiased estimates which would control for the unobservable characteristics, instrument variable regression is used.

More formally, to measure the impact of attendance in private school of a child on the learning outcomes, we assume the following function:

$$Y_i = \alpha + \beta X_i + \gamma D_i + \varepsilon_i \quad (1)$$

where Y_i indicates the learning outcomes for reading, mathematics and writing separately for child, i as discussed. X_i is the vector of control variables and D_i is the primary variable of interest, which is a dichotomous variable indicating whether child, i goes to private school or a government school. Since this is an endogenous variable, we follow a two-step instrument variable regression, where the first stage regression equation is given as follows:

$$D_i = \delta + \phi C_i + \eta Z_i + \nu_i \quad (2)$$

Here C_i is a vector of exogenous variables which affect attendance in private school for child, i and Z_i is the vector of instruments which are highly correlated with D_i but uncorrelated with the error term, ε_i. If attendance in private school is exogenous, D_i should be uncorrelated with the unobservable error term, ε_i. However, if $Cov((D_i, \varepsilon_i) = \rho \neq 0$ due to omitted/unobservable variables as already discussed, then the variable D_i is endogenous.

In our analysis, we make use of treatment-effect model, which explains the effect of an endogenous dichotomous treatment variable on another endogenous continuous variable, conditional on two sets of exogenous variables. The first equation is estimated to predict the probability of treatment using a probit regression. The second equation is an Ordinary Least

Squares (OLS) regression for the outcome variable. The two error terms are assumed to be jointly normally distributed (Khandker et al. 2010).

Results

Descriptive Statistics

Table 1 gives the descriptive statistics as well as lists the variables used in the main regressions. Across each group as listed, it gives the mean test scores for reading, mathematics and writing. We find the average test scores for children from private schools are consistently better than those from public schools. The difference in the scores is found to be statistically significant as well. This indicates the possibility of a causal relationship indicating the role of private schools in improving learning outcomes for the children. However this can only be inferred once the observable as well as unobservable confounding factors are controlled for. This would be done in the next section.

[Table 1 here]

Regression Results

First Stage Regressions:

As discussed earlier, we make use of treatment effects model to estimate the impact of private schooling on learning outcomes among children. As indicated, to control for the possible issue of endogeneity arising due to omitted variable bias, we use two instrument variables: ratio of the number of private schools to public schools at the district level in 2010-11 and availability of private school in the village. These variables should be highly correlated with the probability of a child attending private school but uncorrelated with the unobserved characteristics that affect learning outcomes.

We argue that enrolment of a child in a private school would be high correlated with the number of private schools in the locality relative to the number of public schools. However, this ratio is unlikely to be related with learning outcomes of children. One may argue that unobserved factors affecting learning outcomes may also be in some way related to ratio of number of private schools to public schools. We argue that the unobserved factors pertaining to a child that may affect his/her learning outcomes would not coincide with the unobserved factors that may affect the ratio of number of private schools to public schools. This is because the ratio is taken at the district level and hence macro-level factors would have a role in determining it unlike that for learning outcomes of a child in a village. Further, the ratio is taken from the data for the year 2010-11 whereas the learning outcomes are administered in 2011-12, thus it is pretty unlikely that the ratio at 2010-11 would depend on what would happen in 2011-12. Hence the ratio can be thought as largely exogenous to the outcome variable. Also, even when the regressions are run with the ratio of district level number of private schools to public schools for the years 2009-10 as well as 2008-09 and 2007-08,the results remain largely unchanged. Similarly we also use availability of private schools in a village as our other instrument. However due to some of the problems discussed in section 1 about this instrument, we present the estimations without this instrument as well but find that the inferences do not change.

The statistical validity of the instruments is checked through the usage of "ivreg2" command in STATA and table 2 presents thetest of under-identification and weak identification of the endogenous regressor from regressions of reading, mathematics and writing scores. We find in all three cases that the instruments are identified, strong and valid. The endogeneity tests however reveal that the attendance in private schools is endogenous to reading and mathematics scores but exogenous to the writing scores of the child.

[Table 2 here]

Table 3 presents the first stage regressions (probit model) to estimate the factors that affect the probability of a child being sent to private school. We make use of two different specifications: one with mother characteristics and the other without the mother characteristics. The latter would have more number of observations since there are many children whose mother characteristics are not recorded for several reasons such as the mother may have expired or may not live in the same household or may have gone for longer-term migration. In both these specifications, the results remain largely unchanged. Both the instruments are found to be significantly and positively correlated with the child attending private schooling (at 1% level of significance).

[Table 3 here]

Second Stage Regressions

Table 4, 5, 6 present the second stage regression results for reading, mathematics and writing scores respectively from the treatment effects model. It is found that children who attend private schools as compared to government schools in rural India, have significantly better scores in reading and mathematics and to some extent in writing as well. Since we control for the possible observable as well as unobservable characteristics, the correlation can be inferred to be causal. We also present the estimates from simple OLS regression, which assumes exogeneity of the primary variable of interest. Our results do not change substantially indicating that the estimates are robust. Notably, as discussed earlier, in the endogeneity test for the writing scores, we were unable to reject the null hypothesis that our primary variable (attendance in private school) is exogenous. Hence for writing scores, simple OLS regression would yield unbiased estimates and it indicates the significant role of private schools in better learning outcomes.

[Table 4 here]

[Table 5 here]

[Table 6 here]

In terms of other controls, following from table 1, we find age and educational standard of the child to be important determinants of learning outcomes. Children from households with higher economic status (indicated by consumption expenditure) are found to score better in the reading and mathematics tests. Children from households, whose head is well educated, are likely to score better in all the tests. Of note is the fact that children from female headed households score better than those from male headed households in some of the specifications. This reiterates the findings of Singh et al. (2013). Similar to these findings is the fact that mother's education plays a very important role as well in improving learning outcomes among children. Interesting female children do not perform poorly in comparison to the males except in mathematics probably hinting the prevalence of higher mathematics anxiety among girls (Devine et al., 2012) . We try to explore this in the next section part of which talks about gender differences in learning outcomes for children going to private and public schools.

(i) Further illustrations

To gauge the overall performance of a child in terms of learning outcomes, we develop three different indices each based on the reading, mathematics and the writing score. All the three indices are constructed by normalising the test scores and assigning different weights. Normalisation of test scores is done by dividing 1 by the number of orders in each outcome variable. Hence normalised reading score, which has five categories ranging from 0 to 4,

yields the scores of 0, 0.25, 0.50, 0.75, and 1. Similarly normalised scores for mathematics yields 0, 0.33, 0.66, and 1 and that for writing yields 0, 0.50, and 1.

The first index is generated by giving equal weights (one-third) to each normalised score for reading, mathematics and writing. In the second index, weights are given according to their coefficient of variation which captures the variation in test scores across the sample. This is done in order to give more weight to children performing in tests that had relatively higher variations. The third index is generated by giving weights in accordance the proportion of children scoring highest in each of the tests. A lower proportion indicates that scoring in that particular subject is difficult and a child scoring high in that subject should be given more weightage.

Table 7 presents the estimations obtained through a treatment-effect regression model as used earlier. As expected, children from private schools are found to perform better than those from public schools across all the three indices. The results are found to be significant at 1% level.

[Table 7 here]

As indicated earlier, we are also interested in finding gender difference in learning outcomes across private and public schools. For this purpose, we interact child level gender dummy variable with the dummy for the child going to private schools to get four different categories: male children from private schools, female children from private schools, male children from public schools and females from public schools. Table 8 presents the estimation results from a simple OLS regression of all the three tests using the interaction variables. We find that when male children from private schools are kept as the base or the reference point, female children from private school are not found to be performing significantly worse except in mathematics (at 10% level). However, when male children from public schools are kept as the base, females from public schools are found to perform worse

in reading test and more so in mathematics tests, though no significant difference was found for writing scores. Both these results give an indication of females not performing overwhelmingly in quantitative subjects, controlling for other factors as discussed in some literature (Schultz, 2002; Bander and Betz, 1981; Devine et al., 2012). Nevertheless we find females from private schools to perform significantly better than males from public schools.

[Table 8 here]

Apart from public and private schools, there is another set of schools that is recorded in the dataset, which includes government aided schools, convents, madrassas, open schools and Education Guarantee Scheme (EGS) centres[3]. Since this is a highly heterogeneous group and the proportion of children attending these schools is just about 4.2%, we dropped these schools from our analysis. We now include these to find if these children from these schools perform better. Table 9 gives the estimations from a simple ordered probit regression of the three test scores separately. It is found that in writing and to some extent in mathematics, children from these schools have better test scores as compared to those from public schools. However no significant impact is found in terms of reading scores.

[Table 9 here]

Conclusion

Learning outcomes have been found to be important in shaping up individual earnings, development and hence economic growth. Among many factors including parental education or the health of the child, which affect learning outcomes among children, quality of school also stands out. In the light of the increasing number of children attending private schools over public schools with a hope of better education, it is important to examine if children from private schools perform better in comparison to those from public schools. Using

[3] Alternative schools set up in areas which lack any formal schools and have at least 15 children (between ages 6-14) who are not attending schools.

nationally representative data for 2011-12 and applying standard econometric techniques to control for observable as well as unobservable characteristics, we find performance of children from private school to be significantly better than those from public schools. We also find prevalence of significant gender difference for children going to public schools in terms of mathematics and reading scores. For children attending private schools, gender difference is found in mathematics scores corroborating with the findings of the studies which examine the prevalence of mathematical anxiety among girl students.

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Table 1: Mean test scores across the control variables

	Mean Scores		
	Reading	Mathematics	Writing
Type of school			
Government	2.24	1.27	0.97
Private	2.87	1.72	1.29
Caste and Religion (GROUPS)			
Brahmin, forward castes, Jains, Sikh Christian	2.89	1.75	1.35
Muslims	2.06	1.88	0.91
Other Backward Classes	2.52	1.42	1.08
Scheduled Caste	2.24	1.33	0.99
Scheduled Tribe	2	1.11	0.86
Gender of the child			
Male	2.46	1.46	1.09
Female	2.34	1.31	1.02
Age (in years)			
8	1.92	1.07	0.83
9	2.35	1.36	1.05
10	2.49	1.46	1.1
11	2.97	1.68	1.26
Education level of household head			
Not educated	2.02	1.16	0.9
Educated up to 8th grade	2.47	1.4	1.06
10th grade	2.8	1.67	1.26
12th grade	2.94	1.75	1.28
Undergraduate and above	3.16	2	1.55
Kutcha house	2.14	1.2	0.93
Pucca house	2.57	1.51	1.14

Household does not own television	2.07	1.14	0.88
Household owns television	2.74	1.65	1.24
Does not use computer	2.38	1.37	1.05
Uses computer	3.29	2.25	1.57
Grade that child studies in:			
Grade 1	1.42	0.79	0.63
Grade 2	1.88	1.06	0.84
Grade 3	2.34	1.31	1.04
Grade 4	2.76	1.64	1.20
Grade 5	2.87	1.73	1.27
Grade 6	3.15	1.82	1.37
Grade 7	3.22	1.93	1.42
Income Source			
Organised Business, Salaried or Professional	2.87	1.79	1.33
Cultivation and Allied Agriculture	2.51	1.4	1.08
Agriculture Wage Labour	2.07	1.19	0.94
Non-agriculture wage labour	2.11	1.21	0.92
Artisan/Independent, Petty Shop, Pension/Rent, or Other sources	2.59	1.57	1.15
Household headship			
Male	2.40	1.39	1.05
Female	2.40	1.42	1.08
Education level of the mother			
No education	2.04	1.14	0.86
Up to 8th Grade	2.71	1.58	1.21
10th Grade	2.95	1.82	1.34
12th Grade	3.01	1.97	1.45
Undergraduate or higher	3.28	2.13	1.59

Principle status of mother			
Housework	2.47	1.42	1.08
Other Activity	2.12	1.33	1.01

Source: Author's computations based on IHDS II Data (2011-12)

Table 2: Validity of the instruments

	Reading		Mathematics		Writing	
	Statistic	P-value	Statistic	P-value	Statistic	P-value
Kleibergen-Paap rk LM statistic	60.574	0.000	60.881	0.000	58.682	
Null: Matrix of reduced form coefficients has rank=K1-1 (underidentified)						
Weak identification test (Cragg-Donald Wald F statistic)						
Null: Equation is weakly identified						
Stock-Yogo weak ID test critical values for single endogenous regressor:	29.193		29.435		28.239	
10% maximal IV size	19.93		19.93		19.93	
15% maximal IV size	11.59		11.59		11.59	
20% maximal IV size	8.75		8.75		8.75	
25% maximal IV size	7.25		7.25		7.25	
Overidentification test (Sargen-Hansen Statistic)	1.310	0.252	1.528	0.216	0.163	0.686
Null: Instruments are valid						

Endogeneity test ***Null: specified endogenous regressors are treated as exogenous***	3.784	0.052	4.490	0.034	0.971	0.325

The test statistics are obtained through “ivreg2” command in STATA.

Table 3: First stage probit regressions

	Without mother's characteristics	With mother's characteristics
Instruments (first stage regressions)		
Ratio of private to public schools 2010-11	0.925***	0.886***
	(0.132)	(0.134)
Whether private school available in PSU	0.284***	0.290***
	(0.063)	(0.066)
Controls		
Ref. Brahmins, Other Forward Castes, Jains, Christians and Sikhs		
Muslims	-0.144*	-0.103
	(0.070)	(0.072)
Other Backward Classes	0.043	0.084
	(0.049)	(0.051)
Scheduled Castes	-0.339***	-0.280***
	(0.056)	(0.059)
Schedule Tribe *(Adivasi)*	-0.187*	-0.123
	(0.081)	(0.084)
Ref. Male		
Female	-0.330***	-0.346***
	(0.034)	(0.035)
Age	-0.051***	-0.021
	(0.015)	(0.016)
Child uses computer	0.640***	0.571***
	(0.135)	(0.141)
Household brick, metal, stone, concrete (*Pucca)*	0.212***	0.183***
	(0.040)	(0.042)
Household owns TV	0.333***	0.253***
	(0.041)	(0.043)
Income Source; Ref. Organised Business, Salaried or Professional	0.000	0.000
Cultivation and Allied Agriculture	-0.085	-0.044
	(0.058)	(0.060)
Agriculture Wage Labour	-0.291***	-0.223**
	(0.080)	(0.083)
Non-agriculture wage labour	-0.415***	-0.355***
	(0.064)	(0.066)
Artisan/Independent, Petty Shop, Pension/Rent, or Other sources	0.049	0.086
	(0.065)	(0.067)
Yearly per capita expenditure of Household	0.558***	0.550***
	(0.037)	(0.038)
Age of HH Head	0.010***	0.010***
	(0.001)	(0.001)
Ref. Male HH Head		
Female HH Head	0.104	0.087
	(0.056)	(0.058)

Education Level of the HH Head; Ref. No Education		
Up to 8th Grade	0.140***	0.068
	(0.042)	(0.044)
10th Grade	0.376***	0.242***
	(0.055)	(0.060)
12th Grade	0.429***	0.292***
	(0.076)	(0.081)
Undergraduate or higher	0.658***	0.435***
	(0.098)	(0.104)
Mother's age		-0.021***
		(0.003)
Education level of the mother; Ref. No education		
Up to 8th Grade		0.136**
		(0.044)
10th Grade		0.319***
		(0.067)
12th Grade		0.606***
		(0.095)
Undergraduate or higher		1.026***
		(0.158)
Mother is working outside		-0.169***
		(0.046)
State fixed effects	Yes	Yes
Constant	-6.246***	-5.694***
	(0.430)	(0.446)
Observations	8740	8342
R^2		

The coefficients along with standard errors in parenthesis are reported. Ref. stands reference group and PSU stands for Primary Sampling Unit. *At 10% Level of significance. **At 5% level of significance. ***At 1% level of significance.

Source: Author's computations based on IHDS II Data (2011-12).

Table 4: Estimates for reading scores

	Treatment Effect Model				Simple OLS	
	(1)	(2)	(3)	(4)	(5)	(6)
Ref. Attendance in public school						
Attendance in private school	1.037***	0.958***	1.254***	1.196***	0.558***	0.507***
	(0.161)	(0.168)	(0.178)	(0.184)	(0.038)	(0.039)
Ref. Brahmins, Other Forward Castes, Jains, Christians and Sikhs						
Muslims	-0.131*	-0.081	-0.134*	-0.087	-0.124*	-0.080
	(0.062)	(0.064)	(0.061)	(0.062)	(0.060)	(0.062)
Other Backward Classes	0.020	0.057	0.021	0.057	0.031	0.062
	(0.044)	(0.045)	(0.044)	(0.045)	(0.043)	(0.044)
Scheduled Castes	-0.152**	-0.111*	-0.146**	-0.107*	-0.136**	-0.100*
	(0.049)	(0.050)	(0.048)	(0.050)	(0.048)	(0.049)
Schedule Tribe *(Adivasi)*	-0.286***	-0.206**	-0.282***	-0.205**	-0.267***	-0.191**
	(0.065)	(0.066)	(0.064)	(0.065)	(0.063)	(0.064)
Ref. Male						
Female	-0.036	-0.049	-0.035	-0.048	-0.033	-0.045
	(0.029)	(0.030)	(0.029)	(0.029)	(0.029)	(0.029)
Test Child: Age	0.061***	0.083***	0.062***	0.083***	0.062***	0.083***
	(0.016)	(0.017)	(0.016)	(0.016)	(0.016)	(0.016)
Test child: Class	0.287***	0.281***	0.282***	0.276***	0.282***	0.275***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Test Child: Short Term Morbidity Fever last 30 days	0.017	0.015	0.011	0.010	0.013	0.009
	(0.037)	(0.038)	(0.037)	(0.038)	(0.037)	(0.037)

Child uses computer	0.085	0.063	0.082	0.072	0.110	0.095
	(0.102)	(0.103)	(0.103)	(0.103)	(0.103)	(0.103)
Household brick, metal, stone, concrete (*Pucca)*	0.097**	0.075*	0.098**	0.077*	0.102**	0.080*
	(0.035)	(0.036)	(0.035)	(0.035)	(0.034)	(0.035)
Household owns TV	0.196***	0.145***	0.191***	0.140***	0.189***	0.138***
	(0.037)	(0.038)	(0.036)	(0.037)	(0.036)	(0.037)
Income Source; Ref. Organised Business, Salaried or Professional						
Cultivation and Allied Agriculture	-0.017	-0.012	-0.018	-0.015	-0.012	-0.011
	(0.052)	(0.054)	(0.052)	(0.053)	(0.051)	(0.052)
Agriculture Wage Labour	-0.115	-0.090	-0.104	-0.084	-0.096	-0.075
	(0.067)	(0.069)	(0.066)	(0.068)	(0.065)	(0.067)
Non-agriculture wage labour	-0.123*	-0.105	-0.132*	-0.116*	-0.135*	-0.121*
	(0.058)	(0.059)	(0.057)	(0.058)	(0.056)	(0.057)
Artisan/Independent, Petty Shop, Pension/Rent, or Other sources	-0.093	-0.090	-0.092	-0.089	-0.077	-0.074
	(0.060)	(0.061)	(0.059)	(0.060)	(0.057)	(0.058)
Yearly per capita expenditure of Household	0.122***	0.129***	0.121***	0.129***	0.122***	0.129***
	(0.033)	(0.034)	(0.033)	(0.033)	(0.032)	(0.033)
Homework hours/week	0.014***	0.015***	0.015***	0.015***	0.015***	0.016***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
School hours/week	0.005**	0.006**	0.004	0.004	0.003	0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)

Private tuition expenditure (Rs.)	0.000*	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age of HH Head	0.004***	0.005***	0.004***	0.006***	0.004***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ref. Male HH Head						
Female HH Head	0.144**	0.106*	0.144**	0.103*	0.136**	0.097*
	(0.049)	(0.050)	(0.048)	(0.050)	(0.047)	(0.049)
Education Level of the HH Head; Ref. No Education						
Up to 8th Grade	0.205***	0.151***	0.211***	0.156***	0.213***	0.159***
	(0.037)	(0.038)	(0.036)	(0.038)	(0.036)	(0.038)
10th Grade	0.391***	0.302***	0.400***	0.312***	0.396***	0.308***
	(0.048)	(0.051)	(0.047)	(0.050)	(0.047)	(0.049)
12th Grade	0.411***	0.313***	0.420***	0.326***	0.424***	0.336***
	(0.065)	(0.068)	(0.065)	(0.067)	(0.064)	(0.067)
Undergraduate or higher	0.463***	0.376***	0.452***	0.370***	0.458***	0.377***
	(0.082)	(0.084)	(0.080)	(0.082)	(0.079)	(0.081)
Mother's age		-0.014***		-0.014***		-0.014***
		(0.003)		(0.003)		(0.003)
Education level of the mother; Ref. No education						
Up to 8th Grade		0.214***		0.217***		0.219***
		(0.039)		(0.038)		(0.038)
10th Grade		0.233***		0.222***		0.226***
		(0.058)		(0.057)		(0.056)
12th Grade		0.249**		0.228**		0.221**
		(0.079)		(0.078)		(0.078)
Undergraduate or		0.264*		0.247*		0.280**

higher						
		(0.116)		(0.110)		(0.109)
Mother engaged in outside work		-0.051		-0.042		-0.049
		(0.036)		(0.036)		(0.035)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-1.543***	-1.314**	-1.540***	-1.313**	-1.315***	-1.081**
	(0.398)	(0.407)	(0.391)	(0.400)	(0.388)	(0.397)
Instruments (first stage regressions)						
Ratio of private to public schools 2010-11	1.544***	1.484***	1.521***	1.462***		
	(0.133)	(0.133)	(0.122)	(0.121)		
Whether private school available in PSU	0.651***	0.632***				
	(0.064)	(0.065)				
Constant	-1.468***	-1.437***	-0.874***	-0.861***		
	(0.064)	(0.064)	(0.027)	(0.027)		
athrho						
Constant	-0.244**	-0.230**	-0.361***	-0.358***		
	(0.079)	(0.083)	(0.087)	(0.091)		
lnsigma						
Constant	0.196***	0.186***	0.212***	0.204***		
	(0.012)	(0.012)	(0.017)	(0.017)		
Observations	6867	6566	7055	6749	7237	6925
R^2					0.282	0.293

The coefficients along with standard errors in parenthesis are reported. Model (1) and model (2) are run with both the instruments. Model (3) and model (4) are run with only a single instrument. Ref. stands reference group and PSU stands for Primary Sampling Unit. *At 10% Level of significance. **At 5% level of significance. ***At 1% level of significance.

Source: Author's computations based on IHDS II Data (2011-12).

Table 5: Estimates for mathematics scores

	Treatment Effect Model				Simple OLS	
	(1)	(2)	(3)	(4)	(5)	(6)
Ref. Attendance in public school						
Attendance in private school	0.680***	0.648***	0.811***	0.795***	0.362***	0.322***
	(0.121)	(0.125)	(0.151)	(0.149)	(0.027)	(0.028)
Ref. Brahmins, Other Forward Castes, Jains, Christians and Sikhs						
Muslims	-0.127**	-0.085*	-0.121**	-0.083	-0.113**	-0.075
	(0.043)	(0.044)	(0.042)	(0.043)	(0.042)	(0.042)
Other Backward Classes	-0.002	0.025	0.004	0.029	0.004	0.026
	(0.031)	(0.032)	(0.031)	(0.032)	(0.031)	(0.031)
Scheduled Castes	-0.089*	-0.049	-0.079*	-0.040	-0.081*	-0.045
	(0.035)	(0.035)	(0.034)	(0.035)	(0.034)	(0.035)
Schedule Tribe *(Adivasi)*	-0.147***	-0.110**	-0.148***	-0.114**	-0.147***	-0.114**
	(0.042)	(0.043)	(0.041)	(0.042)	(0.041)	(0.042)
Ref. Male						
Female	-0.096***	-0.100***	-0.094***	-0.097***	-0.091***	-0.095***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.020)
Test Child: Age	0.037***	0.051***	0.040***	0.053***	0.042***	0.056***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Test child: Class	0.178***	0.175***	0.172***	0.169***	0.169***	0.166***

	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Test Child: Short Term Morbidity Fever last 30 days	0.004	-0.003	-0.002	-0.008	0.004	-0.004
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Child uses computer	0.123	0.082	0.112	0.079	0.129	0.092
	(0.081)	(0.081)	(0.079)	(0.080)	(0.079)	(0.079)
Household brick, metal, stone, concrete (*Pucca)*	0.017	0.000	0.020	0.006	0.024	0.010
	(0.023)	(0.024)	(0.023)	(0.023)	(0.023)	(0.023)
Household owns TV	0.124***	0.093***	0.116***	0.087***	0.112***	0.083***
	(0.025)	(0.025)	(0.024)	(0.025)	(0.024)	(0.025)
Income Source; Ref. Organised Business, Salaried or Professional						
Cultivation and Allied Agriculture	-0.066	-0.048	-0.068	-0.052	-0.067	-0.052
	(0.038)	(0.039)	(0.038)	(0.038)	(0.037)	(0.038)
Agriculture Wage Labour	-0.123**	-0.109*	-0.129**	-0.117*	-0.125**	-0.112*
	(0.046)	(0.047)	(0.046)	(0.047)	(0.045)	(0.046)
Non-agriculture wage labour	-0.125**	-0.106**	-0.133***	-0.115**	-0.132***	-0.115**
	(0.040)	(0.041)	(0.040)	(0.040)	(0.039)	(0.040)
Artisan/Independent, Petty Shop, Pension/Rent, or Other sources	-0.049	-0.029	-0.048	-0.029	-0.038	-0.018
	(0.042)	(0.043)	(0.042)	(0.042)	(0.041)	(0.041)
Yearly per capita expenditure of Household	0.061**	0.059*	0.057*	0.055*	0.061**	0.058*

	(0.023)	(0.023)	(0.023)	(0.023)	(0.022)	(0.023)
Homework hours/week	0.012***	0.013***	0.012***	0.013***	0.013***	0.014***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
School hours/week	0.001	0.001	-0.000	-0.000	-0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Private tuition expenditure (Rs.)	0.000***	0.000**	0.000**	0.000*	0.000**	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age of HH Head	0.003***	0.003***	0.003***	0.003***	0.003***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ref. Male HH Head						
Female HH Head	0.075*	0.045	0.081*	0.053	0.086**	0.056
	(0.034)	(0.035)	(0.033)	(0.034)	(0.033)	(0.034)
Education Level of the HH Head; Ref. No Education						
Up to 8th Grade	0.094***	0.052*	0.101***	0.059*	0.100***	0.058*
	(0.024)	(0.025)	(0.023)	(0.025)	(0.023)	(0.024)
10th Grade	0.233***	0.172***	0.236***	0.178***	0.229***	0.170***
	(0.034)	(0.035)	(0.033)	(0.034)	(0.033)	(0.034)
12th Grade	0.283***	0.198***	0.277***	0.197***	0.266***	0.190***
	(0.049)	(0.050)	(0.048)	(0.050)	(0.048)	(0.050)
Undergraduate or higher	0.347***	0.258***	0.361***	0.281***	0.350***	0.268***
	(0.059)	(0.061)	(0.058)	(0.059)	(0.057)	(0.059)
Mother's age		-0.007***		-0.007***		-0.007***
		(0.002)		(0.002)		(0.002)
Education level of the mother; Ref. No education						
Up to 8th Grade		0.146***		0.146***		0.151***

		(0.026)		(0.026)		(0.026)
10th Grade		0.202***		0.180***		0.187***
		(0.042)		(0.041)		(0.041)
12th Grade		0.285***		0.273***		0.277***
		(0.061)		(0.060)		(0.060)
Undergraduate or higher		0.301***		0.272***		0.300***
		(0.084)		(0.082)		(0.081)
Mother engaged in outside work		-0.006		-0.004		-0.000
		(0.024)		(0.024)		(0.023)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.486	-0.342	-0.461	-0.308	-0.379	-0.217
	(0.273)	(0.280)	(0.272)	(0.279)	(0.270)	(0.278)
Instruments (first stage regressions)						
Ratio of private to public schools 2010-11	1.549***	1.492***	1.530***	1.472***		
	(0.134)	(0.134)	(0.124)	(0.123)		
Whether private school available in PSU	0.659***	0.638***				
	(0.065)	(0.066)				
Constant	-1.477***	-1.444***	-0.875***	-0.862***		
	(0.064)	(0.065)	(0.027)	(0.027)		
athrho						
Constant	-0.237**	-0.242**	-0.340**	-0.358**		
	(0.090)	(0.093)	(0.113)	(0.112)		
lnsigma						
Constant	-0.202***	-0.207***	-0.183***	-0.186***		
	(0.013)	(0.014)	(0.020)	(0.021)		
Observations	6845	6549	7030	6729	7211	6904
R^2					0.295	0.306

The coefficients along with standard errors in parenthesis are reported. Model (1) and model (2) are run with both the instruments. Model (3) and model (4) are run with only a single instrument. Ref. stands reference group and PSU stands for Primary Sampling Unit. *At 10% Level of significance. **At 5% level of significance. ***At 1% level of significance.
Source: Author's computations based on IHDS II Data (2011-12).

Table 6: Estimates for writing scores

	Treatment Effect Model				Simple OLS	
	(1)	(2)	(3)	(4)	(5)	(6)
Ref. Attendance in public school						
Attendance in private school	0.522*	0.513	1.385***	1.481***	0.287***	0.265***
	(0.251)	(0.313)	(0.342)	(0.311)	(0.022)	(0.023)
Ref. Brahmins, Other Forward Castes, Jains, Christians and Sikhs						
Muslims	-0.129***	-0.106**	-0.149***	-0.125***	-0.124***	-0.102**
	(0.037)	(0.039)	(0.036)	(0.037)	(0.036)	(0.037)
Other Backward Classes	-0.032	-0.021	-0.038	-0.026	-0.032	-0.024
	(0.026)	(0.027)	(0.026)	(0.026)	(0.026)	(0.027)
Scheduled Castes	-0.107***	-0.087**	-0.106***	-0.087**	-0.104***	-0.086**
	(0.029)	(0.030)	(0.028)	(0.029)	(0.028)	(0.029)
Schedule Tribe *(Adivasi)*	-0.189***	-0.161***	-0.182***	-0.151***	-0.184***	-0.158***

	(0.038)	(0.039)	(0.037)	(0.038)	(0.037)	(0.038)
Ref. Male						
Female	-0.016	-0.028	-0.011	-0.022	-0.014	-0.026
	(0.017)	(0.018)	(0.017)	(0.017)	(0.017)	(0.017)
Test Child: Age	0.043***	0.055***	0.044***	0.053***	0.046***	0.057***
	(0.010)	(0.010)	(0.009)	(0.010)	(0.009)	(0.010)
Test child: Class	0.106***	0.101***	0.099***	0.093***	0.102***	0.097***
	(0.007)	(0.007)	(0.008)	(0.009)	(0.007)	(0.007)
Test Child: Short Term Morbidity Fever last 30 days	-0.003	-0.008	-0.024	-0.031	-0.008	-0.014
	(0.022)	(0.023)	(0.023)	(0.022)	(0.021)	(0.022)
Child uses computer	0.009	-0.014	-0.001	-0.026	0.028	0.009
	(0.067)	(0.067)	(0.063)	(0.061)	(0.064)	(0.064)
Household brick, metal, stone, concrete (*Pucca)*	0.033	0.021	0.037	0.028	0.034	0.022
	(0.021)	(0.021)	(0.020)	(0.021)	(0.020)	(0.021)
Household owns TV	0.087***	0.068**	0.083***	0.064**	0.081***	0.060**
	(0.022)	(0.022)	(0.021)	(0.022)	(0.021)	(0.022)
Income Source; Ref. Organised Business, Salaried or Professional						
Cultivation and Allied Agriculture	-0.070*	-0.067*	-0.066*	-0.062*	-0.058	-0.058
	(0.031)	(0.032)	(0.030)	(0.031)	(0.030)	(0.031)
Agriculture Wage Labour	-0.088*	-0.083*	-0.085*	-0.081*	-0.075*	-0.074
	(0.039)	(0.040)	(0.038)	(0.038)	(0.038)	(0.039)
Non-agriculture wage labour	-0.098**	-0.090**	-0.095**	-0.083*	-0.089**	-0.082*
	(0.034)	(0.035)	(0.033)	(0.034)	(0.033)	(0.033)
Artisan/Independent,	-0.083*	-0.084*	-0.071*	-0.071*	-0.064	-0.067

Petty Shop, Pension/Rent, or Other sources						
	(0.035)	(0.036)	(0.034)	(0.035)	(0.034)	(0.035)
Yearly per capita expenditure of Household	0.018	0.015	0.011	0.007	0.018	0.017
	(0.019)	(0.020)	(0.019)	(0.020)	(0.019)	(0.019)
Homework hours/week	0.009***	0.009***	0.009***	0.009***	0.010***	0.010***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
School hours/week	0.004**	0.003**	0.003*	0.003*	0.002*	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Private tuition expenditure (Rs.)	0.000***	0.000***	0.000**	0.000*	0.000***	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age of HH Head	0.002**	0.002**	0.002***	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ref. Male HH Head						
Female HH Head	0.076**	0.050	0.078**	0.049	0.085**	0.060*
	(0.029)	(0.030)	(0.029)	(0.030)	(0.028)	(0.029)
Education Level of the HH Head; Ref. No Education						
Up to 8th Grade	0.054*	0.026	0.056**	0.024	0.058**	0.032
	(0.021)	(0.023)	(0.021)	(0.022)	(0.021)	(0.022)
10th Grade	0.154***	0.105***	0.155***	0.102**	0.159***	0.113***
	(0.029)	(0.031)	(0.029)	(0.031)	(0.028)	(0.029)
12th Grade	0.113**	0.050	0.116**	0.051	0.125**	0.071
	(0.040)	(0.041)	(0.039)	(0.041)	(0.039)	(0.040)
Undergraduate or higher	0.273***	0.206***	0.257***	0.188***	0.288***	0.226***
	(0.047)	(0.050)	(0.052)	(0.056)	(0.046)	(0.049)

Mother's age		-0.006***		-0.005**		-0.006***
		(0.002)		(0.002)		(0.002)
Education level of the mother; Ref. No education						
Up to 8th Grade		0.105***		0.111***		0.103***
		(0.023)		(0.022)		(0.023)
10th Grade		0.150***		0.147***		0.140***
		(0.035)		(0.034)		(0.034)
12th Grade		0.166**		0.172***		0.152**
		(0.051)		(0.047)		(0.049)
Undergraduate or higher		0.218**		0.171**		0.191**
		(0.067)		(0.066)		(0.064)
Mother engaged in outside work		-0.013		-0.013		-0.011
		(0.021)		(0.021)		(0.021)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.302	-0.161	-0.449*	-0.318	-0.246	-0.115
	(0.241)	(0.250)	(0.228)	(0.232)	(0.232)	(0.239)
Instruments (first stage regressions)						
Ratio of private to public schools 2010-11	1.526***	1.469***	1.270***	1.162***		
	(0.133)	(0.133)	(0.218)	(0.211)		
Whether private school available in PSU	0.644***	0.624***				
	(0.068)	(0.072)				
Constant	-1.457***	-1.425***	-0.818***	-0.790***		
	(0.067)	(0.070)	(0.054)	(0.056)		
athrho						
Constant	-0.206	-0.217	-1.026**	-1.162**		

	(0.218)	(0.273)	(0.370)	(0.359)		
lnsigma						
Constant	-0.343***	-0.344***	-0.159	-0.125		
	(0.023)	(0.030)	(0.099)	(0.093)		
Observations	6824	6529	7009	6709	7177	6871
R^2					0.219	0.226

The coefficients along with standard errors in parenthesis are reported. Model (1) and model (2) are run with both the instruments. Model (3) and model (4) are run with only a single instrument. Ref. stands reference group and PSU stands for Primary Sampling Unit. *At 10% Level of significance. **At 5% level of significance. ***At 1% level of significance.

Source: Author's computations based on IHDS II Data (2011-12).

Table 7: Estimations of the indices

	Equally weighted	Weighted by Coefficient of Variation	Weighted by percentage of top scorers
	(1)	(2)	(3)
Ref. Attendance in public school			
Attendance in private school	0.313***	0.321***	0.298***
	(0.051)	(0.054)	(0.046)
All controls	Yes	Yes	Yes
With instrument	Yes	Yes	Yes
State fixed Effects	Yes	Yes	Yes
Observations	6692	6692	6692
R^2			

The coefficients along with standard errors in parenthesis are reported. Ref. stands reference group. *At 10% Level of significance. **At 5% level of significance. ***At 1% level of significance.

Source: Author's computations based on IHDS II Data (2011-12).

Table 8: Estimates to gauge gender difference in learning outcomes

	With males from private school as base			With males from public school as base		
	Reading	Math	Writing	Reading	Math	Writing
Ref. Males from private schools						
Females from private schools	0.035	-0.086*	0.002			
	(0.054)	(0.039)	(0.032)			
Males from public schools	-0.461***	-0.317***	-0.249***			
	(0.048)	(0.033)	(0.028)			
Females from public schools	-0.536***	-0.414***	-0.285***			
	(0.047)	(0.033)	(0.027)			
Ref. Males from public schools						
Females from public schools				-0.075*	-0.098***	-0.037
				(0.034)	(0.023)	(0.020)
Males from private schools				0.461***	0.317***	0.249***
				(0.048)	(0.033)	(0.028)
Females from private schools				0.496***	0.231***	0.251***
				(0.054)	(0.040)	(0.033)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations						
R^2						

The coefficients along with standard errors in parenthesis are reported. Ref. stands reference group. *At 10% Level of significance. **At 5% level of significance. ***At 1% level of significance.

Source: Author's computations based on IHDS II Data (2011-12).

Table 9: Ordered probit regressions with children from all types of schools

	Reading	Mathematics	Writing
Ref. Attendance in public schools			
Attendance in private schools	0.483***	0.431***	0.428***
	(0.038)	(0.037)	(0.038)
Attendance in other schools	0.076	0.157*	0.196**
	(0.068)	(0.067)	(0.073)
State Fixed Effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	7227	7204	7170
R^2			

The coefficients along with standard errors in parenthesis are reported. Ref. stands reference group. *At 10% Level of significance. **At 5% level of significance. ***At 1% level of significance.

Source: Author's computations based on IHDS II Data (2011-12).