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Understanding the “Sorting Hat”: the Role of Family and Caste Network in School Choice Decision

Sukanta Bhattacharya, Aparajita Dasgupta,
Kumarjit Mandal and Anirban Mukherjee

2015 No. 69



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This paper is one of a series of policy-oriented research papers on privatisation in education jointly commissioned by the Privatisation in Education Research Initiative (PERI) and Young Lives using school survey data from the Young Lives longitudinal study of childhood poverty in Ethiopia, India, Peru and Vietnam. The findings of these diverse studies reflect on the manner and extent to which the varied supply of schooling types and private tutoring influences the pivotal role education has to play in societal development and building sustainable futures for all.

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About Young Lives

Young Lives is a longitudinal study of childhood poverty following the lives of 12,000 children in Ethiopia, India, Peru and Vietnam over 15 years. It is funded by UK aid from the Department for International Development (DFID) and co-funded by the Netherlands Ministry of Foreign Affairs from 2010 to 2014 and by Irish Aid from 2014 to 2015. The full text of Young Lives publications and more information about its work is available on the Young Lives website: www.younglives.org.uk

Abstract

Sorting of students over school type by their social standing creates the problem of social segregation and educational inequality. This paper, both theoretically and empirically, identifies factors which are responsible for sorting of students by socio-economic groups across different types of schools. We elaborate on the sorting mechanism by analyzing schools choice decisions where parents decide on the following: whether to send their children to private/public school and conditional on that whether to send them to good or bad school. We find that household characteristics such as the number of siblings, caste identity affect these two choices differently. For example we find that general caste students are more likely to attend private school but within the private category they are more likely to end up in bad schools. We develop our theory using a two period household level optimization framework and validate the prediction using a school survey data (Young Lives Survey).

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1. Introduction

The issue of school choice and its subsequent impact on the future generation's earning opportunity assumes a central role in the economics of education. Conventional wisdom sees wealth as the most important binding constraint for the poor families in their choice of good quality education for their kids. The poor families' inability to afford good quality education for their kids traps them in the low level equilibrium (Galor and Zeira, 1993). In the current paper however we examine the roles of non-wealth socio economic factors such as caste identity, household size, sibling composition, gender composition and gender of the children in the process of school choice. Unlike Harry Potter's Hogwarts School of Witchcraft and Wizardry where students were sorted into different school houses using a sorting hat, school choice decisions by regular parents follow a rational, optimizing structure by taking the returns to education in consideration. Such decision making mechanism would mean, at least theoretically, that parents from similar socio-economic background will choose similar type of schools for their children leading to caste or gender based sorting of students in different type of schools. In this paper we develop a model for school choice decision and subsequent sorting, and empirically test the results.

In our paper a child's schooling decision is seen as a decision to invest in human capital with the objective of maximizing lifetime utility. Because in a country like India, future income opportunities also depend on social factors such as caste and gender, we theoretically expect that school choice for children will be a function of the parent's socio economic background. In this backdrop the contribution of our paper is to theoretically treat the public/private choice and the school quality choice as two related but different choices and establish the roles of gender, caste and other socio-economic parameters in these two choices.

In our theoretical model we show that these two choices follow distinctly different rationale which finds support in the empirical section where the factors which affect the public/private choice in one way, affect the school quality choice in another way. Moreover, we empirically estimate the role played by caste, gender and other socio-economic parameters in school choice decisions.

The existing literature on school choice largely focus on the effect of schooling on learning and subsequent income generation. A section in the growth economics focuses on schooling as it determines the future educational attainment and the gains in productivity for the society (Lucas Jr, 1993). However, it is the quality of education and not just enrollment that gets translated into high income for future generations (Pritchett, 2001). Studies have confirmed that the difference in the quality of schooling is often responsible for the learning gaps in the children leading to differences in the future earnings of the pupil Glewwe et al. (2014). Parents therefore tend to choose the best quality education that they can afford for their children. However, in the absence of full information about a school's quality, parents often equate the management structure (private or public) with quality of the schools.

An important section of the literature discusses the relative difference in schooling quality between private and public where the school quality is being measured by pupil–teacher ratio, class size, teachers' salaries and experience (James and Woodhead, 2014). Some

scholars found that students enrolled in private schools learn better than the students in public schools and this learning gap is often termed as private school premium (Checchi and Jappelli, 2003; Singh, 2013). Besides school management type (public/private), the choice of school also depends on both subjective (e.g. belief about work culture within the school) and objective indicators (e.g. the school resources/infrastructure in each geographical area). It is possible to link the school choice to aggregate school resources as well as individual decision-making by appropriate combinations of both these factors (Checchi and Jappelli, 2003). It has also been observed that school choices are often guided by the soft qualities such as uniforms, degree of discipline within school rather than the hard qualities such as teachers' qualifications and in terms of the soft qualities private schools usually fare better than their public counterparts (Azim Premji Foundation, 2013).

Because schooling is costly, schools choice often depends on household wealth, sibling composition and household size. Butcher and Case (1994) find that in the United States between 1920-1965 women's educational choices have been affected by sex composition of her siblings while that of men have not. They found that women raised only with brothers received more education than women raised with sisters. Black et al. (2005) found that in Norway for an extended period birth order has significant negative effect on children's education.

The fact that the cost of education is increasing in the quality of education, leads to the possibility of sorting—students from higher socio-economic status end up in better schools while the children from backward groups attend bad quality schools. This phenomenon is well researched in the context of developed countries (Card and Rothstein, 2007; Urquiola, 2005; Burgess et al., 2004).

Sorting can also take place along the gender line. Long and Conger (2013) find strong gender sorting across U.S. schools within sectors and types with higher gender sorting in counties that have higher shares of enrollment in private and non-regular public schools. This sorting occurs even after accounting for parental preferences for school attributes for their sons and daughters. This issue is also related to the issue of differential investment in girl's education. Azam and Kingdon (2013), using data from India Human Development Survey (2005) find a difference in education expenditure by ages 10–14, and a difference in enrollment by ages 15–19. One of the reasons behind this is that boys are more likely to be sent to private schools, which is generally considered to be of higher quality than free public schools. Evidence from developing countries finds differential investments in childhood health, gender differences in household inputs such as educational investments, parental time, and food.

Jensen (2012) finds that increasing awareness of employment opportunities for women increased enrollment and body mass index of younger school-aged girls (ages 5–15) pointing that parents invest in girls more when the potential of their future returns are improved. In a similar line of research Munshi and Rosenzweig (2006) find that increasing returns to English combined with caste-based networks are driving increased school enrollment and investment for girls in cities in India. The idea is that while boys can get blue collar jobs through caste network, girls may not as those jobs are not deemed suitable for them. On the other hand, girls can work in white collar jobs which require the knowledge of English language. Hence, when there is increased returns to

English language skills in India there is increase in girls educational investments in English medium schools.

In this paper we analyze the schooling decision using a two period inter temporal optimization by the parents. We see children's education decision as a decision to invest in human capital. The cost of education, in our model, is assumed to be increasing in the quality of education. Private schools are also costlier than the public schools. Hence, the primary trade-off used in the model is general to any investment decision—better quality of education brings in more income in future, but that involves higher sacrifice of consumption at the present. However, we conjecture that one's social standing complements education in deciding her future income and therefore, we should see that the choice of education systematically varies with caste and other socio economic variables.

The present study has made an attempt to verify the results from the analytical model in the light of the Young Lives (YLS) data set. The indexation for good quality school has been carried out by averaging the school infrastructure, teacher quality and school facilities. To find the determinants of choice for the good quality school a set of probit regressions has been carried out. The results from the econometric exercise broadly corroborate the results from the analytical exercise. The suggestion that household wealth plays an important role in determining the choice of quality school has been validated by the data. We find mixed evidence on private school premium.

The remaining part of the study is organized as follows: the next section describes the analytical model, section 3 discusses the YLS data set, section 4 focuses on the econometric results and section 5 concludes the study.

2. Model

We set up a two-period model of household decision making about investment in education vis-a-vis physical capital. The preference of a household is characterized by the utility function

$$U(c_1, c_2) = c_1^\sigma + \delta c_2^\sigma \quad (1)$$

where c_t denotes household consumption in period t , $t = 1, 2$ and $\sigma \in (0, 1)$ denotes the elasticity of intertemporal substitution. At the beginning of period 1, a decision-making household is endowed with wealth w . The wealth may be utilized either by spending on current consumption, or by investing on a risk-free asset that fetches a gross return of R per unit next period. Additionally, the household also has to decide on its investment in the child's education.

There are two types of schools in the society where children may be sent—the government schools and the private schools. The type of school a household chooses for its child is denoted by i where $i = p, g$. In our model $i = g$, stands for government school and $i = p$ stands for private school. Both types of schools exhibit variation in quality. We denote the quality of a school by an index $q \in [\underline{q}, \bar{q}]$. The direct cost of sending a child to a type school of quality q is $\phi_i q$, $i = g, p$. Thus, the costs are more for better quality schools. We also assume $\phi_p > \phi_g \geq 0$ which in essence formalizes the fact that the cost of sending a child to a private school is higher than that of a government school of same quality presumably because fees are higher. If a family chooses to send its child to a type i school of quality q and decides to invest in the risk-free asset, then the wealth available for current consumption is $w - \phi_i q - s$. However, there is another aspect of sending a child to a good quality school. A good quality school requires more effort from the child and other family members and thus reduces its ability to transform current wealth into current consumption. If a family chooses type i school of quality q for its child, then its current consumption can be written as

$$c_1 = \beta(q) [w - \phi_i q - s] \quad (2)$$

We assume that $\beta' < 0$. Specifically for the sake of simplicity we choose

$$\beta(q) = \frac{A}{q} \quad (3)$$

where $\beta(\cdot)$ denotes the factor that converts current wealth into current consumption.

On the other hand, if a child is sent to a school with higher quality, it improves her learning and as a result increases her earning potential in future. For a child who goes to a type i school of quality q , the expected future return from education is

$$\gamma_i(q, \theta) \cdot Y$$

We assume that a child's future earning is positively linked with the quality of school q and a socio-cultural parameter $\theta \in [\underline{\theta}, \bar{\theta}]$ which captures the capability of transforming the learning into income earning potential, i.e. $\frac{\partial \gamma_i}{\partial q} > 0$ and $\frac{\partial \gamma_i}{\partial \theta} > 0$. Moreover, we also assume that $\frac{\partial \gamma_p}{\partial q} > \frac{\partial \gamma_g}{\partial q}$, i.e. the marginal return to quality in private schooling is

higher than the same in government schools in the long-run. This assumption demands some clarifications. Suppose that the marginal return to schooling in a particular type of school is an increasing function of average school quality of that type, i.e. $\alpha_i = \alpha(q_i)$ with $\alpha' > 0$ where q_i is the average quality of a child going to type school. This may be due to the fact that the employer doesn't observe the true quality of the school of an applicant at the point of entry to the working life of the applicant, but has information about the average quality of the type of school the applicant has attended. Hence, the entry point wage would be a function of q_i instead of the true quality q . Now, if everybody (including the potential employer) believes that $q_p > q_g$, then (as we show later Proposition 2) a child belonging to the richer households would choose private schools. Since the richer households also choose better quality schools, the average quality of a child going to a private school would be higher and the belief becomes self-fulfilling. Alternatively, the employers may be willing to provide a premium to people with some particular skills (e.g. computer handling skill or English speaking skill). In case the employer doesn't observe the child's true skill, but is aware that these skills are better acquired in private schools because they are equipped with better infrastructure or teacher composition required to develop these particular skills, the employer may attach a premium for private school attendants.

Once again, we choose a simple multiplicative form for the coefficient $\gamma_i(q, \theta)$ in

$$\gamma_i(q, \theta) = \alpha_i q \theta \tag{4}$$

with $\alpha_p > \alpha_g > 0$. Finally, we can interpret Y as the minimum future wage for a child. A child with characteristic θ going to a government school of quality q earns $\gamma_g(q, \theta) Y$ in her working life. Without loss of generality, we choose parameter values such that $\gamma_g(q, \theta) = 1$.

We can now formally state the household's choice problem. The household chooses both the type of school ($i \in \{g, p\}$) as well as the quality of school (q) it will send its child to at date 1. This reflects its investment in human capital. The household also decides on its investment in physical capital (s). These investments in turn determine the household's consumption at date 2 which can be expressed as

$$c_2 = Rs + \gamma_i(q, \theta) \cdot Y \tag{5}$$

The intertemporal budget constraint can thus be written as

$$\frac{c_1}{\beta(q)} + \frac{c_2}{R} = w - \phi_i q + \frac{\gamma_i(q, \theta) \cdot Y}{R} \tag{6}$$

The household's choice problem is maximization of (1) subject to the constraint (6). Among household's choice variables, school type and school quality affect the household's budget constraint, but do not directly affect the utility. However, while school type affects the present value of life-time consumables of any household, school quality affects the same present value as well as the relative price between present and future consumption. In other words, school type only induces a wealth effect on consumption choice while school quality generates a wealth effect as well as a price effect.

In the household's choice problem, c_1, c_2 and q are continuous variables while i is a discrete variable. We follow a two step procedure to solve the household's problem. First for a given $i \in \{g, p\}$, we determine the household's optimal choices of c_1, c_2 and q . In the second step, we determine a household's optimal choice of i . Given any $i \in \{g, p\}$, the optimality conditions for the household's choice problem are

$$\left(\frac{c_1}{c_2}\right)^{\sigma-1} = \frac{\delta R}{\beta(q)} \quad (7)$$

and

$$-\frac{c_1}{[\beta(q)]^2} \beta'(q) + \phi_i = \frac{\delta}{\delta q} [\gamma_i(q, \theta)] \cdot \frac{Y}{R} \quad (8)$$

along with (6). Since the utility function is strictly quasi-concave, the choice problem has a unique solution. Using the functions from (3) and (4), we can solve for the optimal choices of the households as

$$c_1^*(i) = A \left[\frac{\alpha_i \theta Y}{R} - \phi_i \right]$$

$$c_2^*(i) = R w$$

And

$$q^*(i) = \frac{R^{1-\sigma} (w - f \cdot i)^{1-\sigma} A^\sigma}{\delta R \left[\frac{\alpha_i \theta Y}{R} - \phi_i \right]^{1-\sigma}}$$

In our first proposition, we exhibit how for the children going to a particular type school, the choice of school quality is affected by changes in different parameters of the model.

Proposition 2.1 For children going to a particular type of school (either government or private), the quality of school is positively associated with wealth level (w) and the household's current productivity (A) and negatively associated with the child's capability of transforming learning into income (θ) as well as the minimum future wage (Y).

The results are along expected line. First consider an increase in w . If everything else remains same, this leads to an increase in c_1 . However any increase in c_1 , reduces the marginal rate of substitution between present and future consumption and the household's willingness to pay for future consumption in terms of present consumption rises. This leads to an increase in q as school quality increases future consumption at the same time making current consumption costlier. The other results in proposition 1 can be intuitively explained in similar manner.

We are now in a position to examine the choice of school type by a household. For a household that chooses school type $i \in \{0, 1\}$ the indirect utility function can be written as

$$\begin{aligned} V_i(w, f, A, \alpha_i, \theta, \delta) &= [c_1^*(i)]^\sigma + \delta [c_2^*(i)]^\sigma \\ &= \left[\frac{A\alpha_i\theta Y}{R} \right]^\sigma + \delta [R(w - f.i)]^\sigma \end{aligned}$$

Hence, the incremental utility from choosing a private school for its child is given by

$$\begin{aligned} \Delta V &= V_1 - V_0 \\ &= \left[\frac{A\alpha_1\theta Y}{R} \right]^\sigma + \delta [R(w - f)]^\sigma - \left[\frac{A\alpha_0\theta Y}{R} \right]^\sigma - \delta [Rw]^\sigma \end{aligned}$$

Since $\sigma < 1$, ΔV is strictly increasing in w . Thus the benefit for going to a private school is higher for wealthier households. Notice that if α_1 is so high relative to α_0 such that

$$\left[\frac{A\theta Y}{R} \right]^\sigma (\alpha_1^\sigma - \alpha_0^\sigma) \geq \delta [Rf]^\sigma$$

then every household sends its child to private school and the government schools have no takers. However, if

$$\left[\frac{A\theta Y}{R} \right]^\sigma (\alpha_1^\sigma - \alpha_0^\sigma) < \delta [Rf]^\sigma \tag{9}$$

holds, then for any $w \leq f$, $\Delta V < 0$. But as $w \rightarrow \infty$, $\Delta V > 0$ follows from $\alpha_1 > \alpha_0$. Since ΔV is continuous and strictly increasing in w , there exists a critical $w_c \in (f, \infty)$ such that $\Delta V \geq 0$ if and only if $w \geq w_c$. This leads to our second proposition.

Proposition 2.2: Suppose g holds. Then there exists a critical wealth level $w_c \in (f, \infty)$ such that a household sends its child to private school if and only if its wealth level $w \geq w_c$. Moreover, w_c falls as θ or A increases, but rises as f increases.

The households with higher wealth are more likely to send their children to private schools. This is what one expects given diminishing marginal utility of present consumption and higher expected future return from private schools. However, an increase in θ may induce a household to send its child to a private school who would not have done so otherwise. θ is a socio-cultural parameter in our model which captures the household's capability of transforming education into income earning potential. We can think of θ as a parameter representing the social standing of the household which eventually matters when the child enters the job market. For example, we expect that general castes would have a higher θ than the backward castes. People living in urban areas are expected to have higher θ than people residing in rural areas. This is because educated urban youth face a better chance to match the skills learnt in school with the job they ultimately land than their rural counterparts. We thus expect that children from general categories or children in urban households are more likely to attend private schools even when we control for family wealth or income.

3. Data

The data used in this study comes from the Young Lives study which was collected between 2002 and 2011 in the state of Andhra Pradesh. The sites were selected from three different agro-climatic areas and had a pro-poor bias with districts and sites being ranked according to a number of development indicators (Kumra, 2008). The administrative sub-districts (mandals) are the primary sampling units in our sample. We use data of the younger cohort of children born between January 2001 and June 2002. We make use of the rich demographic array of indicators from the household survey for example parental/caregiver education, wealth index of the household, caste, religion, household head's gender, number of siblings, sibling composition, child anthropometry, a host of school level outcomes (cognitive outcomes and test scores in mathematics, Telugu and English, sector (rural/urban), region/community type, whether member of any social group, number of household members giving financial support to the child, the number of school going kids present in the household, birth order of the child, whether household suffered from any major bad event in the last four years etc. Additionally we use the separate schooling data collected through visits to the schools of a randomly selected sub-sample of the Younger Cohort in 2011. Attrition rate in the data is very low—1930 children (96 per cent) in the Younger Cohort sample could be followed in 2009. Overall attrition by the third round was 2.2% (with attrition rate of 2.3 per cent for the younger cohort) over the eight-year period. In 2011, the Young Lives study randomly sampled 247 schools which were being attended by children in the Younger Cohort. The sampling frame consisted of all the Younger Cohort (YC) children who were still enrolled in school in Round 3 (2009–10) and were going to school within Andhra Pradesh. The sample included 952 children across 247 schools. The school-level survey was conducted between December 2010 and March 2011, i.e. in the school year immediately following the third wave of household-level data collection (Singh, 2013). The survey captured detailed school-level differences in infrastructure and funding, teacher qualifications and characteristics, classroom characteristics, teaching procedures and children's subjective experiences of schooling. It administered questionnaires to all school principals, teachers and detailed information on the mathematics teachers of the sample children from the younger cohort.

(Andhra Pradesh is divided into 23 administrative districts that are further subdivided into mandals. Generally, there are between 20 and 40 villages in a mandal. In total, there are 1,125 mandals and 27,000 villages in Andhra Pradesh (Kumra, 2008))

4. Results

In the empirical section first we build indices of school quality using different parameters. Then we look into the matter of sorting of students into good schools (and also government school) according to their socio economic characteristics and intrinsic ability as reflected in their pre-school cognitive score.

4.1 School Quality Index

We classify good school based broadly on two indices: teacher quality and school infrastructure. For construction of teacher quality index we use information on the highest level of education completed of the teacher and highest level of teacher training. The infrastructure index uses the following information at the facility level: number of fully covered separate rooms for teaching, having a secure compound wall/fence, availability of electric connection, alternative sources of power, availability of drinking water in school premises, availability of drinking water on the day of the survey, whether classes sharing the same classroom, having computer, internet facility, first aid, play material, sports kit, music kit, art material, school bell, television and functioning toilets. At a later stage we also breakdown the infrastructure index as infrastructure and facility indices. In the infrastructure group we include information mainly on school building and toilets while under facility we include computer, internet facility, first aid, play material, sports kit, music kit, art material, school bell, television etc.

For each indicators we normalize their value [0 1] and use the composite index for defining a good school (if the value is greater than the mean score). For making the indicators comparable we take the actual value of the above mentioned categories and normalize them by the following formula for a variable x

$$I_x = \frac{x - \underline{x}}{\bar{x} - \underline{x}} \quad (10)$$

where \underline{x} denotes the minimum value of x and \bar{x} denotes the maximum.

In this section we report the results from running the following Probit model

$$Pr(z = 1) = \Phi(X\beta) \quad (11)$$

where z takes the value 1 when a student attends a good school (government school for the first regression) and 0 otherwise. X represents variables of interest such as family size, family asset, parental education, network etc and other relevant controls. We start by estimating the equation for both the rural and urban areas. Eventually we test the equation separately for rural and urban areas and include different controls for testing robustness.

4.2 Sorting According to Parental Characteristics

In our theory, we have looked at two relevant school choices: public vs private and good school vs bad school. Conventional belief equates private school with an indicator of

good school—a belief which is confirmed by our data on the basis of average values. Nevertheless, there are several dimensions—other than quality—believed to be embedded in a private school. Such dimensions include but are not limited to network effect—people gain by following other community members’ school choice decision. Hence, the choice of school organization (private or public) needs to be analyzed separately. This is why our theory centers around two distinct decisions: private vs public and good vs bad. In the empirical section we treat these two separately as well. Also, we empirically analyze the school choice for rural and urban setting separately.

We start by trying to find what type of households send their kids to private schools. We find that general caste households are less likely to send their kids to government schools. Similarly, families with more educated primary caregiver for their children (this will be parents or close relatives) are more likely to send their children to private schools. Similarly, male children are more likely to end up in private schools while kids with siblings are less likely to go to private schools.

In our study a school can be characterized along three dimensions: quality (score) location (rural/urban) and organization (government or private). In Table 1 we present the summary statistics. This is a student level data where we collate their family characteristics, location, caste and school score. Note that, data is not available for all variables for all students. In Table 1, we present the summary statistics for the whole sample.

We start by looking at the factors influencing the first decision variable: private or public school. We find that wealthy families are more likely to send their kids to private schools. General caste households are also likely to send their kids to private schools. We also find that male children, children without siblings and children with educated primary caregivers (usually parents) are more likely to attend private schools. However, we maintain the point that even if school organization (government or private) signals quality, there is high degree of variation of quality within each type. This justifies our separate analysis of decisions regarding public/private and good school/bad school choice. In Table 2 we represent the distribution between good and bad school across government and private categories. We find that among the bad schools 53% are private while 47% are government when we consider rural and urban area together. However, the balance is more tilted towards the private schools in the urban area than in the rural (Tables 3 and 4). Among the urban good schools 84% are private while 16% are public. On the other hand, among the rural good schools, 56% is private and 44% are government. We also emphasize the multi-dimensionality of school quality.

In Tables 5 and 6 we present the mean qualities of private and government schools which are measured along three dimensions—teacher’s quality, school facility and schools infrastructure. In all these categories an average private school fares better than its government counterpart. The gap between private and government is very high when it comes to facility or infrastructure. For teacher’s quality, the average private school is marginally better than the government one.

In the next step we see how different family characteristics affects the probability of going to good school for different settings such as rural and urban. We further analyze the decision in the following subcategories: rural government, rural private, urban government and urban private.

In Table 7 we report the results of Probit regression with the probability of going to government school in rural location as the dependent variable. In columns (1)-(3) we use different controls. We find as expected that more wealthy and general caste parents are less likely to send their kids to government schools. Also male kids are less likely to go to government school. Moreover, kids with siblings are more likely to go to government school. This is consistent with our model's prediction. With more kids, the total monetary cost of sending them to private school goes up and children with more sibling end up in government schools. The results are similar for urban setting (Table 8).

Then we look at the choice for sending to a good school. We measure good school by different combination of quality parameters defined earlier. We mainly take three things in consideration—infrastructure, teacher's qualification and average school score of class V which may reflect other unobserved characteristics of the school which may help learning. Our main index is a simple aggregate of three parameters. In a sense this is arbitrary. But it is important to note that whatever way we construct the index, it is impossible to avoid arbitrariness completely. Hence, to check whether our result is driven by the construction of index, we define the school quality based on three, two parameters respectively. We also do the same with only parameter—infrastructure. However, the results are not very sensitive to the definition of "good." The results are reported separately for urban and rural schools from Table 9–Table 14.

In this regression there are a few variables of interest such as wealth, primary caregiver's education, caste and number of siblings. Contrary to conventional wisdom, wealth is not consistently affecting the choice of good schools. When we define school quality on the basis of teacher's qualification and infrastructure, we find that wealthy families in rural areas are likely to send their kids to good school. For urban areas however, the sign is positive but not significant. If we use three variables to define school quality—teacher's qualification, infrastructure and previous score—the result is positive in rural areas but not significant. For urban areas, however, the coefficient shows both positive and negative sign depending on control. But in none of the cases the coefficients are significant. If we define good school solely on the basis of school infrastructure, the marginal effect of wealth is positive and significant in rural areas. In urban area however, that effect is negative but not significant.

The impact of primary caregiver's education on the choice of school quality is the most consistent one. We find that across the specifications, families with higher caregiver's education (which in most case is same as parental education) are more likely to send their kids to good schools. This can be rationalized in many ways. It could be that such families have better information about the school quality or it could be the case that good schools require home inputs for students which more educated families find easier to provide.

Next we ask whether general caste families are more likely to send their kids to good schools? Again, the result is mixed. If we define school quality on the basis of teacher's qualification and infrastructure the general caste's effect is positive but not significant in rural area. For urban, the effect is negative and significant. If quality is defined by teacher's qualification, infrastructure and previous score, the effect is positive but not significant in both rural and urban areas. If quality is defined on the basis of infrastructure, general caste's effect on good school choice is again positive but not significant in rural

areas but negative, significant in urban areas. So by and large, general castes families are less likely to send their kids to good school in urban areas. For rural areas, caste identity does not have a big role to play in school quality choice. If quality is defined on the basis of previous score, general caste is positive significant in rural and positive but not significant in urban. However, remember that in both urban and rural areas higher caste are more likely to send their kids to private school. This lends support to our initial hypothesis private/public choice are different from good/bad choice.

4.3 Sorting According to Cognitive Ability

In this section we ask if there is any association between good schools and good students. Specifically, we ask if students with higher cognitive and PPVT test scores from round 2 get sorted in good schools as observed in round 3. For measuring their pre school cognitive ability we use PPVT and cognitive score (both normalized) from the round 2 of YLS. In the pooled sample for both rural and urban we find that cognitive and PPVT scores have positive sign on their marginal effect on the probability of attending good schools. But the coefficients are not significant. However, students with higher cognitive score are less likely to go to government schools. PPVT score also has negative impact but the coefficient is not significant.

If we divide the sample in two groups—government and private—and run the same regression for school quality based on good infrastructure. We find that students' cognitive ability is not related to their selection into good schools under both the categories. We run the same regressions for different sub groups such as rural private, rural public, urban private and urban public. In none of the cases the coefficients turn out to be significant.

4.4 Return to School Type

In this section we try to estimate the marginal return of sending a kid to government school. The return is measured in terms of marks they scored in their school examinations. The results are reported in Table 17. However, the public school effect on mathematics performance is not significantly different from zero. For English on the other hand, we get a strong negative effect. The result is preserved when we use normalized scores. But this could also be true because private schools are attracting good quality students. Therefore, we take control of the students' round 2 PPVT and cognitive scores. We find no significant difference in the pattern of the results. Even after controlling for period 2 cognitive ability we still find significant negative effect of the government schools on English score and no significant impact on Math score. However, the size of the marginal effect for English goes down after we control the cognitive scores. It should also be noted that among the period 2 scores PPVT has no significant effect, while cognitive test score has a positive significant impact on current mathematics score.

Next we look for government school penalty among the bad schools using the same regression structure. Interestingly, we find that among the bad schools, government schools have a greater positive impact on mathematics score than their private school counterpart. This is true even after controlling for period 2 cognitive ability (Table 18). However, such premium vanishes when we look at the good schools. For English

however, government schools remain worse than the private one's across all categories. One interesting result emerges when we compare the government school penalty among the English medium schools with that among the non-English medium schools. We find that the government school English penalty only exist for the non-English medium schools. For the English medium schools no difference exists among the government and private schools when it comes to the English performance.

5. Conclusion

This paper analyzes the school choice decision using a theoretical model and tests the testable implications using data. We analyze the decision making using an inter-temporal optimization model that sees children's education as investment in human capital. The trade-off from the decision making comes from two channels: the resource saved from not sending a child to a costly school can be invested in physical capital and the child's saved time can be used for household work. Unlike the standard literature, we use two stage decision making to distinguish between the decisions of sending a kid to a private schools and sending her to a good/bad school once the public/private decision has been taken. We find that the way the social and cultural variables affect the public/private school decision are not the same they affect good/bad school choice. Our empirical results support these theoretical results. This allows us to conclude that for given wealth families from different socio-cultural background send their children to different quality schools which have profound effect on their future earning in the micro level and social mobility in the macro level. By analyzing the school choice mechanism we create a space in the policy regime to discuss appropriate policies.

References

- Azam, M. and Kingdon, G.G. (2013). Are girls the fairer sex in India? revisiting intra-household allocation of education expenditure. *World Development*, 42:143–164.
- Azim Premji Foundation (2013). Private schools are no panacea. Black, S.E., Devereux, P.J., and Salvanes, K.G. (2005). The more the merrier? the effect of family size and birth order on children’s education. *The Quarterly Journal of Economics*, pages 669–700.
- Burgess, S., McConnell, B., Propper, C., and Wilson, D. (2004). Sorting and choice in english secondary schools. Centre for Market and Public Organisation Working Paper, 4:111.
- Butcher, K.F. and Case, A. (1994). The effect of sibling sex composition on women’s education and earnings. *The Quarterly Journal of Economics*, 109(3):pp. 531–563.
- Card, D. and Rothstein, J. (2007). Racial segregation and the black–white test score gap. *Journal of Public Economics*, 91(11):2158–2184.
- Cecchi, D. and Jappelli, T. (2003). School choice and quality. Technical report, IZA Discussion paper series.
- Galor, O. and Zeira, J. (1993). Income distribution and macroeconomics. *The review of economic studies*, 60(1):35–52.
- Glewwe, P., Krutikova, S., and Rolleston, C. (2014). Do schools reinforce or reduce learning gaps between advantaged and disadvantaged students? evidence from vietnam and peru.
- James, Z. and Woodhead, M. (2014). Choosing and changing schools in india’s private and government sectors: Young lives evidence from andhra pradesh. *Oxford Review of Education*, 40(1):73–90.
- Jensen, R. (2012). Do Labor Market Opportunities Affect Young Women’s Work and Family Decisions? Experimental Evidence from India. *The Quarterly Journal of Economics*, 127(2):753–792.
- Kumra, N. (2008). An assessment of the young lives sampling approach in andhra pradesh, india.
- Long, M.C. and Conger, D. (2013). Gender sorting across k–12 schools in the united states. *American Journal of Education*, 119(3):349–372.
- Lucas Jr, R.E. (1993). Making a miracle. *Econometrica: Journal of the Econometric Society*, pages 251–272.
- Munshi, K. and Rosenzweig, M. (2006). Traditional institutions meet the modern world: Caste, gender, and schooling choice in a globalizing economy. *The American Economic Review*, pages 1225–1252.
- Pritchett, L. (2001). Where has all the education gone? *The World Bank Economic Review*, 15(3):367–391.
- Singh, A. (2013). Size and sources of the private school premium in test scores in india. *Young Lives Working Paper*, 98.
- Urquiola, M. (2005). Does school choice lead to sorting? evidence from tiebout variation. *American Economic Review*, pages 1310–1326.

Appendix

Table 1—*Summary statistics*

Variable	Obs	Mean	Std. Dev.	Min	Max
Good School	953	0.6977964	0.4594541	0	1
Household Size	953	5.555089	2.429977	2	22
Wealth Index	953	0.3892927	0.190981	0.0111111	0.8796296
Hindu	953	0.8982162	0.3025226	0	1
General Caste	953	0.1752361	0.3803685	0	1
Caregiver Education	953	2.725079	4.052954	0	15
Region	953	22.02833	0.8226284	21	23
Male	953	0.5362015	0.4989496	0	1
Birth Weight	356	2740.067	544.2736	1,000	4,500
Brothers	951	0.3322818	0.6448165	0	6
Sisters	951	0.4374343	0.7691604	0	5
School Kid	944	0.7245763	1.002854	0	6
Siblings	953	1.351522	0.4776961	1	2
Gender Structure	953	1.786988	0.7543701	1	3
Group Membership	951	0.3280757	0.4786388	0	2
Bad Event	953	0.5152151	0.5000309	0	1
Rural	953	0.8100735	0.3924488	0	1

Table 2—Rural and urban combined

	Private	Government	Total
Bad School	12 (4.17)	276 (95.83)	288 (100)
Good School	353 (53.08)	312 (46.92)	665 (100)
Total	365 (38.3)	588 (61.7)	953 (100)

Table 3—Urban area

	Private	Government	Total
Bad School	105 (88.24)	14 (11.76)	119 (100)
Good School	52 (83.87)	10 (16.13)	62 (100)
Total	157 (86.74)	24(13.26)	181(100)

Table 4—Rural area

	Private	Government	Total
Bad School	130 (20.57)	502 (79.43)	632 (100)
Good School	78 (55.71)	62 (44.29)	140 (100)
Total	208 (26.94)	564 (73.06)	772 (100)

Table 5—Private school quality according to different parameters

Variable	Obs	Mean	Std. Dev.	Min	Max
Good Facility	365	0.6191781	0.4862555	0	1
School Infrastructure	365	0.6671233	0.2250182	0.25	1
Good Infrastructure	365	0.8931507	0.3093456	0	1
Teacher Quality	365	0.660274	0.4742663	0	1

Table 6—Government school quality according to different parameters

Variable	Obs	Mean	Std. Dev.	Min	Max
Good Facility	588	0.1462585	0.353666	0	1
School Infrastructure	588	0.2614796	0.1989539	0	1
School Infrastructure	588	0.2397959	0.4273223	0	1
Teacher Quality	588	0.4132653	0.4928389	0	1

Table 7—*Dependent variable: government school, rural location*

	(1)	(2)	(3)
Household Size	0.017 (0.025)	0.001 (0.032)	-0.033 (0.034)
Wealth Index	-2.525*** (0.425)	-2.650*** (0.440)	-2.417*** (0.459)
Hindu	-0.253 (0.229)	-0.358 (0.241)	-0.439 (0.257)
General Caste	-0.468** (0.161)	-0.419* (0.174)	-0.332 (0.191)
Caregiver Education	-0.116*** (0.018)	-0.123*** (0.019)	-0.120*** (0.020)
Male	-0.627*** (0.122)	-0.686*** (0.128)	-0.646*** (0.134)
Siblings	0.341** (0.129)	0.270* (0.135)	0.173 (0.143)
Number of Siblings	0.008 (0.064)	0.072 (0.070)	0.163* (0.080)
Gender Structure	0.006 (0.077)	-0.001 (0.080)	-0.054 (0.084)
Group Membership Level	0.086 (0.115)	0.124 (0.120)	0.149 (0.127)
Bad Event	0.291* (0.128)	0.255 (0.134)	0.192 (0.143)
Region	-0.493*** (0.085)	-0.492*** (0.087)	-0.607* (0.284)
Household Support		-0.024 (0.044)	0.020 (0.048)
Community ID			-0.010* (0.004)
Sentinel Site			0.059 (0.041)
PPVT Score			-0.437 (0.446)
Cognitive Score			-0.768* (0.379)

Table 8—*Government school: urban location*

	(1)	(2)	(3)
Household Size	0.075 (0.072)	-0.017 (0.103)	-0.084 (0.130)
Wealth Index	-2.196 (1.348)	-3.078* (1.458)	-1.568 (1.600)
Hindu	-0.834 (0.426)	-0.711 (0.448)	-0.808 (0.498)
General Caste	-1.309** (0.458)	-1.221** (0.473)	-1.355** (0.504)
Caregiver Education	-0.036 (0.033)	-0.031 (0.034)	-0.041 (0.037)
Male	-0.083 (0.363)	-0.182 (0.371)	0.136 (0.404)
Siblings	0.134 (0.378)	0.038 (0.390)	0.218 (0.449)
Number of Siblings	0.364* (0.184)	0.520* (0.217)	0.428 (0.255)
Gender Structure	-0.166 (0.244)	-0.191 (0.247)	-0.113 (0.270)
Group Membership Level	0.024 (0.377)	-0.115 (0.406)	-0.361 (0.462)
Bad Event	-0.370 (0.492)	-0.201 (0.500)	-0.229 (0.563)
Region	-0.256 (0.173)	-0.249 (0.183)	1.392 (0.728)
Household Support		0.304 (0.178)	0.354 (0.209)
Community ID			-0.004 (0.008)
Sentinel Site			-0.213* (0.096)
PPVT Score			-0.939 (1.220)
Cognitive Score			-0.820 (1.046)

Table 9—Good school based on teacher qualification and infrastructure in rural location

	(1)	(2)	(3)	(4)
Household Size	0.007 (0.023)	-0.009 (0.028)	0.007 (0.029)	0.023 (0.030)
Wealth Index	1.568*** (0.357)	1.578*** (0.365)	1.559*** (0.370)	1.459*** (0.376)
Hindu	-0.030 (0.194)	-0.017 (0.199)	-0.020 (0.201)	-0.039 (0.205)
General Caste	0.065 (0.161)	0.117 (0.172)	0.189 (0.180)	0.175 (0.188)
Caregiver Education	0.045** (0.017)	0.043* (0.018)	0.047** (0.018)	0.043* (0.019)
Male	0.197 (0.102)	0.201 (0.105)	0.201 (0.106)	0.186 (0.108)
Siblings	-0.171 (0.116)	-0.182 (0.120)	-0.179 (0.122)	-0.122 (0.125)
Number of Siblings	-0.025 (0.054)	-0.011 (0.057)	-0.020 (0.058)	-0.048 (0.060)
Gender Structure	-0.013 (0.068)	0.005 (0.070)	-0.006 (0.071)	0.005 (0.072)
Group Membership Level	-0.028 (0.100)	-0.049 (0.103)	-0.077 (0.104)	-0.106 (0.106)
Bad Event	-0.129 (0.110)	-0.130 (0.114)	-0.118 (0.117)	-0.110 (0.118)
Region	0.209** (0.067)	0.212** (0.068)	0.889*** (0.234)	0.892*** (0.243)
Household Support		0.015 (0.039)	0.008 (0.040)	-0.013 (0.042)
Sentinel Site			-0.062 (0.033)	-0.064 (0.034)
Community ID			-0.011*** (0.003)	-0.012*** (0.003)
PPVT Score				0.032 (0.405)
Cognitive Score				0.379 (0.311)

Table 10—Good school based on teacher qualification and infrastructure in urban location

	(1)	(2)	(3)	(4)
Household Size	0.520* (0.208)	0.567* (0.235)	0.544 (0.320)	0.490 (0.340)
Wealth Index	0.771 (2.396)	0.166 (2.484)	5.066 (3.449)	4.967 (3.658)
Hindu	0.113 (0.624)	0.055 (0.639)	0.226 (0.703)	0.178 (0.719)
General Caste	-1.632* (0.705)	-1.672* (0.724)	-2.484* (1.041)	-2.419* (1.052)
Caregiver Education	0.133* (0.055)	0.145* (0.058)	0.196* (0.084)	0.204* (0.095)
Male	0.183 (0.515)	0.065 (0.565)	0.894 (0.756)	0.468 (0.811)
Siblings	-0.165 (0.518)	-0.121 (0.565)	0.306 (0.663)	0.014 (0.875)
Gender Structure	-0.004 (0.330)	-0.170 (0.383)	-0.026 (0.438)	0.002 (0.540)
Bad Event	0.403 (0.558)	0.583 (0.586)	1.176 (0.742)	1.071 (0.797)
Region	-1.194** (0.393)	-1.118** (0.397)	2.747 (1.673)	2.583 (1.759)
Household Support		0.455 (0.384)	1.028 (0.567)	0.855 (0.610)
Sentinel Site			-0.489* (0.208)	-0.481* (0.222)
Community ID			0.012v	0.014 (0.026)
PPVT Score				-0.189 (2.010)
Cognitive Score				-1.423 (1.747)

Table 11—Good school based on teacher qualification, infrastructure and average class V score: rural

	(1)	(2)	(3)	(4)
Household Size	0.015 (0.025)	0.035 (0.031)	0.035 (0.031)	0.035v
Wealth Index	0.492 (0.385)	0.503 (0.399)	0.506 (0.399)	0.514 (0.406)
Hindu	-0.261 (0.201)	-0.232 (0.210)	-0.233 (0.210)	-0.243 (0.213)
General Caste	-0.181 (0.170)	-0.288 (0.186)	-0.283 (0.188)	-0.227 (0.193)
Caregiver Education	0.062*** (0.017)	0.072*** (0.018)	0.072*** (0.018)	0.078*** (0.019)
Male	0.160 (0.118)	0.168 (0.123)	0.169 (0.123)	0.183 (0.125)
Siblings	-0.119 (0.130)	-0.206 (0.136)	-0.207 (0.136)	-0.187 (0.139)
Number of Siblings	0.053 (0.063)	0.044 (0.068)	0.044 (0.068)	0.011 (0.072)
Gender Structure	-0.069 (0.078)	-0.053 (0.082)	-0.054 (0.082)	-0.048 (0.083)
Group Membership Level	-0.209 (0.115)	-0.306* (0.123)	-0.307* (0.123)	-0.318* (0.125)
Bad Event	-0.042 (0.123)	-0.045 (0.130)	-0.046 (0.130)	-0.067 (0.133)
Region	-0.099 (0.078)	-0.073 (0.080)	-0.057 (0.125)	-0.037 (0.127)
Household Support		-0.032 (0.045)	-0.033 (0.045)	-0.023 (0.047)
Community ID			-0.001 (0.004)	-0.001 (0.004)
PPVT Score				-0.693 (0.431)
Cognitive Score				0.051 (0.359)

Table 12—Good school based on teacher qualification, infrastructure and average Class V score: urban

	(1)	(2)	(3)
Household Size	-0.081 (0.061)	-0.108 (0.084)	-0.162 (0.096)
Wealth Index	0.508 (1.105)	-0.315 (1.183)	-0.425 (1.332)
Hindu	0.176 (0.327)	-0.019 (0.344)	0.081 (0.366)
General Caste	-0.262 (0.268)	-0.391 (0.281)	-0.411 (0.296)
Caregiver Education	0.003 (0.027)	0.013 (0.029)	0.017 (0.031)
Male	0.279 (0.277)	0.296 (0.283)	0.264 (0.297)
Siblings	-0.417 (0.273)	-0.471 (0.281)	-0.418 (0.297)
Number of Siblings	0.413* (0.170)	0.457* (0.191)	0.529** (0.204)
Gender Structure	-0.260 (0.192)	-0.290 (0.196)	-0.303 (0.206)
Group Membership Level	0.349 (0.295)	0.479 (0.307)	0.311 (0.321)
Bad Event	0.457 (0.328)	0.452 (0.342)	0.437 (0.351)
Region	-0.821*** (0.153)	-0.930*** (0.165)	-1.099*** (0.195)
Household Support		0.115 (0.144)	0.183 (0.158)
Community ID			0.006 (0.005)
PPVT Score			-0.427 (0.695)
Cognitive Score			0.310 (0.801)

Table 13—Good school based on infrastructure: rural

	(1)	(2)	(3)
	Good Infr	Good Infr	Good Infr
Household Size	0.009 (0.022)	0.028 (0.027)	0.047 (0.029)
Wealth Index	1.411*** (0.351)	1.436*** (0.360)	1.366*** (0.370)
Hindu	0.071 (0.192)	0.094 (0.197)	0.095 (0.201)
General Caste	0.002 (0.153)	0.005 (0.162)	0.097 (0.174)
Caregiver Education	0.064*** (0.016)	0.066*** (0.017)	0.072*** (0.018)
Male	0.330** (0.101)	0.350*** (0.105)	0.352** (0.108)
Siblings	-0.164 (0.114)	-0.174 (0.118)	-0.155 (0.122)
Number of Siblings	0.018 (0.054)	-0.019 (0.058)	-0.054 (0.061)
Gender Structure	0.009 (0.067)	0.021 (0.069)	0.031 (0.071)
Group Membership Level	-0.010 (0.098)	-0.044 (0.102)	-0.096 (0.105)
Bad Event	-0.181 (0.109)	-0.148 (0.113)	-0.198 (0.116)
Region	0.295*** (0.068)	0.299*** (0.069)	0.544*** (0.122)
Household Support		-0.029 (0.038)	-0.048 (0.041)
Community ID			-0.008* (0.004)
PPVT Score			-0.016 (0.381)
Cognitive Score			-0.060 (0.311)

Table 14—Good school based on infrastructure: urban

	(1)	(2)	(3)
	Household Size	0.139 (0.088)	0.126 (0.107)
Wealth Index	-0.027 (1.226)	-1.320 (1.409)	-2.334 (1.627)
Hindu	0.077 (0.338)	-0.210 (0.379)	-0.064 (0.423)
General Caste	-0.557 (0.321)	-0.810* (0.361)	-0.810* (0.403)
Caregiver Education	0.088** (0.031)	0.104** (0.034)	0.107** (0.039)
Male	0.024 (0.298)	-0.004 (0.310)	-0.150 (0.351)
Siblings	-0.461 (0.323)	-0.558 (0.343)	-0.500 (0.392)
Number of Siblings	-0.244 (0.178)	-0.252 (0.200)	-0.189 (0.220)
Gender Structure	0.055 (0.195)	0.028 (0.199)	-0.028 (0.229)
Group Membership Level	-0.002 (0.348)	0.308 (0.406)	0.444 (0.441)
Bad Event	0.423 (0.403)	0.349 (0.419)	0.082 (0.455)
Region	-0.040 (0.157)	-0.155 (0.173)	-0.270 (0.267)
Household Support		0.036v	0.078 (0.186)
Community ID			0.011 (0.009)
PPVT Score			1.997 (1.254)
Cognitive Score			1.088 (0.863)

Table 15—Good school based on school’s average class V score: rural

	(1)	(2)	(3)
	Good Score	Good Score	Good Score
Household Size	0.008 (0.031)	-0.010 (0.037)	-0.043 (0.039)
Wealth Index	0.685 (0.494)	0.672 (0.500)	1.047* (0.528)
Hindu	0.165 (0.257)	0.172 (0.260)	0.057 (0.290)
General Caste	0.646* (0.284)	0.624* (0.291)	0.594 (0.311)
Caregiver Education	-0.034 (0.023)	-0.034 (0.023)	-0.015 (0.025)
Male	0.042 (0.143)	0.034 (0.145)	0.093 (0.152)
Siblings	-0.159 (0.158)	-0.166 (0.160)	-0.287 (0.169)
Number of Siblings	0.103 (0.077)	0.109 (0.079)	0.208* (0.090)
Gender Structure	0.075 (0.095)	0.075 (0.096)	0.010 (0.100)
Group Membership Level	-0.093 (0.134)	-0.098 (0.137)	-0.079 (0.144)
Bad Event	0.143 (0.146)	0.115 (0.149)	0.081 (0.156)
Region	-0.297*** (0.089)	-0.282** (0.090)	-0.140 (0.161)
Household Support		0.030 (0.052)	0.078 (0.057)
Community ID			-0.006 (0.005)
PPVT Score			-1.262** (0.467)
Cognitive Score			-0.410 (0.446)

Table 16—Good school based on school’s average class V score: urban

	(1)	(2)	(3)
	Household Size	-0.038 (0.063)	-0.017 (0.084)
Wealth Index	-1.046 (1.148)	-2.937* (1.367)	-3.020* (1.515)
Hindu	0.044 (0.340)	0.085 (0.354)	0.336 (0.387)
General Caste	0.290 (0.306)	0.310 (0.319)	0.466 (0.344)
Caregiver Education	-0.009 (0.028)	-0.009 (0.030)	-0.008 (0.033)
Male	-0.210 (0.295)	-0.324 (0.310)	-0.334 (0.333)
Siblings	-0.591* (0.289)	-0.783* (0.306)	-1.033** (0.348)
Number of Siblings	0.800*** (0.188)	0.852*** (0.216)	0.934*** (0.229)
Gender Structure	-0.089 (0.197)	-0.096 (0.205)	-0.001 (0.226)
Group Membership Level	0.359 (0.350)	0.519 (0.387)	0.447 (0.414)
Bad Event	1.290** (0.416)	1.411** (0.450)	1.661*** (0.495)
Region	-1.129*** (0.169)	-1.264*** (0.188)	-1.681*** (0.313)
Household Support		0.079 (0.138)	0.123 (0.149)
Community ID			0.016 (0.009)
PPVT Score			-1.107 (0.794)
Cognitive Score			0.075 (0.919)

Table 17—Government school premium/punishment: full sample

	Full Sample			
	Math Score	Eng Score	Normal Score Eng	Normal Score Math
Govt School	-0.018 (0.417)	-4.081*** (0.416)	-0.151*** (0.015)	-0.001 (0.020)
Household Size	0.007 (0.075)	0.025 (0.075)	0.001 (0.003)	0.000 (0.004)
Wealth Index	1.828 (1.077)	2.821** (1.079)	0.104** (0.040)	0.087 (0.051)
Hindu	0.376 (0.540)	0.793 (0.546)	0.029 (0.020)	0.018 (0.026)
General Caste	0.828 (0.468)	0.691 (0.465)	0.026 (0.017)	0.039 (0.022)
Caregiver Education	0.170*** (0.051)	0.194*** (0.050)	0.007*** (0.002)	0.008*** (0.002)
Region	-1.512*** (0.213)	-0.555* (0.216)	-0.021* (0.008)	-0.072*** (0.010)
Male	-0.097 (0.343)	-0.246 (0.348)	-0.009 (0.013)	-0.005 (0.016)
Siblings	-0.424 (0.381)	-0.355 (0.382)	-0.013 (0.014)	-0.020 (0.018)
Brothers	-0.749** (0.287)	-0.733* (0.291)	-0.027* (0.011)	-0.036** (0.014)
Sisters	0.031 (0.239)	-0.164 (0.246)	-0.006 (0.009)	0.001 (0.011)
Gender Structure	0.125 (0.236)	-0.187 (0.239)	-0.007 (0.009)	0.006 (0.011)
Group Membership Level	-0.089 (0.335)	-0.194 (0.339)	-0.007 (0.013)	-0.004 (0.016)
Bad Event	-0.189 (0.350)	-0.512 (0.352)	-0.019 (0.013)	-0.009 (0.017)
PPVT Score	0.656 (1.109)	-0.655 (1.102)	-0.024 (0.041)	0.031 (0.053)
Cognitive Score	6.498*** (0.965)	4.438*** (0.978)	0.164*** (0.036)	0.309*** (0.046)

Table 18—Government school premium/punishment: good and bad schools

	Good School	Bad School	Good School	Bad School
	Normal Score Math	Normal Score Math	Normal Score Eng	Normal Score Eng
Govt School	0.001 (0.022)	0.280** (0.096)	-0.166*** (0.016)	0.154 (0.087)
Household Size	-0.005 (0.004)	0.013 (0.007)	-0.003 (0.003)	0.010 (0.007)
Wealth Index	0.093 (0.061)	0.118 (0.102)	0.061 (0.043)	0.303** (0.094)
Hindu	0.016 (0.030)	-0.022 (0.054)	0.013 (0.022)	0.013 (0.048)
General Caste	0.054* (0.025)	0.046 (0.049)	0.044* (0.018)	-0.010 (0.044)
Caregiver Education	0.006* (0.003)	0.016** (0.005)	0.007*** (0.002)	0.009 (0.005)
Region	-0.066*** (0.012)	-0.069*** (0.018)	-0.021* (0.009)	-0.007 (0.018)
Male	-0.018 (0.020)	0.035 (0.029)	-0.018 (0.014)	0.015 (0.027)
Siblings	-0.027 (0.021)	0.002 (0.035)	-0.016 (0.015)	0.015 (0.032)
Brothers	-0.040* (0.017)	-0.029 (0.024)	-0.030* (0.012)	-0.031 (0.022)
Sisters	0.006 (0.014)	-0.012 (0.021)	-0.002 (0.010)	-0.015 (0.019)
Gender Structure	-0.005 (0.014)	0.027 (0.021)	-0.009 (0.010)	-0.008 (0.019)
Group Membership Level	-0.017 (0.019)	0.010 (0.029)	-0.000 (0.014)	-0.040 (0.027)
Bad Event	-0.003 (0.020)	-0.038 (0.031)	-0.015 (0.014)	-0.053 (0.029)
PPVT Score	0.018 (0.060)	0.034 (0.114)	-0.043 (0.042)	0.030 (0.104)
Cognitive Score	0.326*** (0.055)	0.269** (0.084)	0.157*** (0.040)	0.153 (0.079)



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