Information Provision and the Quality of Education in Rural India

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Abstract

I study if information provision improves the academic performance and school participation of students and influences parental school choice when there are both public and private schools. This is important because such market settings where there are public and competing private providers are becoming increasingly common in developing countries. 32 contiguous village councils (or panchayats) of one district in the north Indian state of Rajasthan were randomly assigned to either a control or one of four treatment groups in which all schools and/or some parents were provided with different report cards on the performance of students in curriculum based tests. Students were first tested on three commonly taught subjects in schools- Hindi, Math and English in the beginning of the school year in 2011. All primary schools in all villages were included in this study. Two post-intervention tests were conducted- one at the end of the same academic year and the second in the new academic year. In the post-interventions, I found higher attendance among private school students in treatment villages. The probability of baseline students being absent from schools decreases by 0.03 to 0.05 in treated villages. I find significant improvement in test scores of private schools students in the fourth treatment. On average, normalised test scores improved by 0.22 SD when parents and schools were provided information on relative school quality. Closer examination of the results suggest that this was due to the provision of report cards to parents and not so much schools. I find no impact on public school test scores and attendance. There is some evidence of parents exercising school choice as a result of information.

0.1 Introduction

The poor learning outcomes and low quality of teaching in public schools in India are well-known. Only half of children enrolled in grade 5 in rural public schools could read texts meant for second-graders (Pratham (2009)). These schools have been found to have high teacher absenteeism with around 25% of teachers being absent without leave on an average school day in a nation-wide survey of rural schools (Muralidharan and Kremer, 2006). It is, therefore, not surprising that enrolment in private schools has been steadily on the rise. This has happened in urban as well as rural areas. Desai et al. (2009) claim that around 24% of children aged 6 to 14 in villages are enrolled in private schools. While the learning outcomes in private schools have been found to be better than public schools, there is considerable variability in the quality of these schools (Pratham (2009); Wadhwa (2009)).

An often cited reason for this dismal scenario is that parents may not be able to assess the academic performance of their children and the quality of education imparted in schools. They may, therefore, base their choice of schools on parameters other than academic performance such as a school's distance and social composition (Hastings et al., 2005). This could lead to poor choice of schools, low parental and student effort levels and insufficient pressure on schools to improve academic achievement.[1] In India, where a quarter of adults are illiterate and many students first-generation learners, such information gaps are likely to be high.[2] We examine two questions in this chapter. First, we study if providing information on student and aggregate school academic performance to parents and schools influences students' achievements in curriculum based tests, their school participation and school choices in rural India. Second, we want to identify if this information is effective when disseminated to parents, who form the demand side of education, or schools, that form the supply side.

We randomly assigned 32 contiguous village councils (or panchayats) of Ajmer district in the northern state of Rajasthan to either a control or one of four treatment groups. Information was disseminated in treatment panchayats by means of report cards to parents or schools or both. We first tested students of grades 4 and 5 of all private and public schools in the

[1] For instance, Pop-Eleches and Urquiola (2013) using data from Romania find that when students were selected to attend better performing schools parents reduced homework related help. Similarly, Das et al. (2013) find that households withdraw spending on education when there is an increase in school funding. The World Development Report (2004) cites beneficiaries lack of knowledge about their entitlements as the reason why public services in health and education in developing countries is poor.

[2] Adult literacy figure from Ministry of Human Resources, India website. Banerjee et al. (2007) find that parents in villages of India systematically overestimate learning abilities of students.

panchayats on three commonly taught subjects in schools- Hindi, Math and English. Based on student outcomes in our baseline tests, we provided four different combinations of report cards in the treated panchayats so that each treatment increased the amount of information provided. In the first treatment, parents received a report card while schools did not. In this parental card, we reported their child's absolute score in our tests, her rank in class and the average performance of the class. Parents continued to receive the same report card in the second and third treatments but we started providing school principals separate report cards. We reported the only average performance of each tested grade in a school to the principal in the second treatment. In the third, we added the grade-wise average test scores of all schools in a panchayat in the school report card. In the fourth treatment, schools continued to get the report card with their absolute and relative performance in the panchayat but we added the relative performance of all schools and the student's rank in the panchayat to the parental report cards. Each of our treatments enable us to identify if the information mattered to parents or schools and the effectiveness of absolute or relative feedback.

When we went back for the post-intervention surveys, we found higher attendance among private school students in treatment villages and the probability of being absent on a school day was lower in these schools by 0.03 to 0.05. This introduced high and selective attrition from our student panel. We use inverse probability weights to correct for selection. We find that there was some improvement in test scores of private schools. The average normalized test score, combined for all subjects, of private school students in our baseline tests was 0.68 SD. This improved by 0.22 SD in our fourth treatment while we see no average effect on test scores of the other treatments. There were, however, some differential impacts by the baseline score of students in some of them. We find that the students ranked between 25th to 75th percentile in their class increased test scores by 0.18 SD, 0.27 SD and 0.29 SD in the first, second and fourth treatment.

We find no impact on public school test scores and attendance. This dissimilarity in the responses of private and public schools can be partly attributed to the operational differences of these schools. Private schools depend on fees paid by students while public schools are financed by the state government. Public school resources are not linked to student outcomes. This could mean that the financial incentive to improve services may be lower for public schools. On the other hand, it is important for a private operator to differentiate itself on the quality of services to stay in business specially when there is a public school that provides the same service free of cost. Another possible explanation could be that public schools face rigid resource constraints and may not be able to make immediate adjustments

of existing resources to improve quality.

Since our treatments provided incremental information to recipients, we were able to identify if the additional information in each successive treatment had an impact on outcomes. We do not find any impact on test scores of informing schools of their absolute outcomes. However, when schools are informed of the performance of all schools in the panchayat along with their own, we see lower improvements in test scores of private schools compared to when only their absolute performance is reported. We argue that this could be because private schools were all ranked high in their panchayats and informing them of their ranks may not have added much value to their information set. The incremental impact of informing parents of the relative performance of their child and school to all others in the panchayat was 0.27 SD compared to when they were knew only the position of the child in her class and the absolute performance of the school. This suggests that enabling parents to compare schools led to improvements in overall test scores in the fourth treatment.

The impact of information provision has been studied with mixed findings. Banerjee et al. (2008) find no learning improvements from information dissemination at the community-level on the quality of education in public schools in rural India. In contrast, Björkman and Svensson (2010) argue that health provider report cards led to a sharp decline in infant mortality due to an increase in provider effort Uganda. Jensen (2012) finds that providing information to parents on employment opportunities for girls increased their likelihood of being enrolled in school in India. Some studies have highlighted the negative impact of information. For instance, Dranove et al. (2003) show that public disclosure of heart surgery outcomes at physician and hospital level in two states of US led to selection of the healthier patients for surgery while the very ill patients were left out. Figlio and Getzler (2006) find that the No Child Left Behind program which requires states to rank public schools on a high-stakes examination led to schools in one state of US to classify low-performing students and those from poor socio-economic background as 'disabled' and transferred to special education programs. Thus, information could lead to selection of students by schools with the worse students being left out.

Our study contributes to this literature by studying how information matters in a setting where there are both public and private providers. Such a setting is becoming increasingly common in developing countries. Our results are similar to those of Andrabi et al. (2014) who find that providing report cards to households and schools in rural Pakistan improve private school test scores but not so much in public schools. Our study is close to this and the report cards provided in our fourth treatment are similar to the report cards in

Pakistan. We see our study as adding value by being able to separate the effect of providing information to households and schools.

Our results shed light on school choice by parents. If parents cannot fully assess the quality of education in schools, then providing information may enable parents to choose a better school subject to their budget constraint. Evidence on this, too, is conflicting. For instance, Hastings and Weinstein (2008) provide evidence that low-income households in one public school district in USA chose better schools for their children when school rankings were reported. On the other hand, Mizala and Urquiola (2013) report no consistent impact on school enrolment when parents are informed about the *value added* to academic performance by schools. In our study, we could determine the enrolment status of a randomly selected subsample of students a year from our intervention through household surveys. We find that students in the fourth treatment chose schools that had better average test scores and were ranked high in their panchayat at the baseline. We do not see this effect in the other treatments. This is not surprising because this was the only treatment where we reported school ranks to parents.

We now discuss the context of our study.

0.2 The Context: Private and Public Schooling

The growth of private schools in rural areas of India is a recent phenomenon which accelerated since the liberalizaton of the economy in the late nineties.[3] Some studies have argued that some of these private schools are increasingly catering to the poor (Tooley and Dixon (2003)). We chose to conduct our experiment in Rajasthan because the growth of private school enrolment in this state has been rapid. In less than a decade, between 2006 and 2014, the percentage of children aged 6 to 14 enrolled in rural private schools increased from 25% to 42%. The quality of private and public schools in the state differ a lot. Around 65% of children enrolled in grade 5 in private schools could read a text meant for grade 2. The same figure for public schools was 35% (Pratham, 2014). Although primary enrolment rates in the state was around 92%, the adult literacy rate of Rajasthan is around 53%, lower than the national average of 63%.[4] Thus, many students may be first generation school goers.

[3]Muralidharan and Kremer (2006) in their national survey of rural schools found that most private schools had been established since 1997.

[4]Source: India Development Indicator, 2012. Adults are defined as persons above 15 years of age

Our study was conducted in villages of Ajmer district in Rajasthan. This district is marked by rapid urbanisation yet rural areas have remained poor. For instance, 62% of villages have access to paved roads in Ajmer. On the other hand, rural wages are extremely low (Rs 54 per day compared to the state average of around Rs 70 per day).[5] The average literacy rate in this district was 59% in 2011, lower than the state average of 62% (Census, 2011). Adult literacy rates are likely to be lower still. Thus, this area is marked by a possibly high demand for education given its proximity to urban areas as well poor socio-economic conditions. We designed our study keeping in mind the scope and challenges that such a unique setting provides.

We selected an acceptable demarcation of a closed geographical and rural administrative area and included all schools in all 73 villages from 32 village councils in this area. Figure 1 shows a schematic map of the area.[6] Instead of randomly choosing villages, we covered all of them because of our expectation that information could expand the potential choice set to schools outside the village. We first confirmed that this is a possibility by a village survey in which we asked local officials to list all schools that children at the primary level attended. We found that at least some students in about 30% of villages attended primary schools outside the village but seldom outside the panchayat. The average number of primary schools -public or private- in a village was 2.2 and in a panchayat was 5. Every village had at least one public school with primary grades (grades 1 to 5). 30 of these had only a single public school. More than half of our villages had at least one private school. All but 2 panchayats had access to at least one private school located within their boundaries. This suggests that there was considerable availability of schooling options.

Private and public schools in our area differ from each other in several aspects. Apart from being completely free, public schools are required to enrol every student who seeks admission. On the other hand, private schools can select students. Private schools face little regulation on setting their fees. Yet, their operating costs may be low because of lower teacher salaries (Kingdon (1996), (Muralidharan and Kremer, 2006)). Unlike public schools, private school teachers are almost always contractual. The curriculum taught in both types of schools are similar and most private schools use textbooks designed by the state education

[5]Statistics from World Food Program (2009) *Report on Food Security in Rural Rajasthan.*

[6]We chose villages of two adjoining clusters of village councils (called panchayat samities), Srinagar and Kishangarh. A cluster of village councils with close socio-economic ties form a panchayat samiti which forms a link between village councils and the state development authority. The panchayat samiti is responsible for implementation of development works including investments in primary education. We chose all 55 villages from all 24 village councils of Srinagar and 23 from 8 village councils of Kishangarh which were at the border of Srinagar.The village list for was obtained from the office of the *Patwari* (the official in charge of measuring land and demarcating boundaries).

board. In both types of schools, students in primary grades cannot be detained even if they do not pass examinations. These exams are held and graded internally by schools and are not standardised to enable comparison across schools. Private schools can, however, de-register poorly performing students. The feedback mechanisms of these schools vary as well. While most schools claim to provide some form of report cards to parents, these are hardly ever discussed with parents. Parent-teacher associations are non-existent. Parents who are barely literate may not be able to fully comprehend report cards or benefit from them. We designed our report cards (discussed in later sections) in a manner that enabled parents to understand the information we provided even if they could not read.

0.3 Study Design

The study was conducted in three rounds with the baseline near the beginning of the academic year in August-September 2011. In this round, we administered language and math tests to 5155 students enrolled in grades 4 and 5 in 159 schools in 73 villages. 65 of these schools were privately run.[7] These tests were given to all students *present on the day of visit* within school hours. On average, we were able to test 83% of all students enrolled in a class.

We chose grades 4 and 5 for three reasons. First, these are the highest grades of primary education. Parents are at the point when they have to decide if a child should continue education to higher levels or not.[8] Therefore, they may be more sensitive to the quality of education and respond to information provision on the same. Second, these students would soon transition to secondary education and are at a point where they may need to make school choice. We could use these grades to study how parents choose schools. Furthermore, we felt that these students were old enough to understand instructions and be able to take

[7]There were actually 168 schools with grades 1 to 5 in the 78 selected villages. We excluded 6 public schools which had no enrolment in primary grades and 3 that did not participate in the baseline. The 5 villages we could not include in our baseline were small villages with around 120 or fewer households and a single public primary school which had no students enrolled in grades 4 and 5. From the village survey, we found that students in these villages went to schools in neighbouring villages which were part of our study area. In this way we were able to represent the school choice available to these villages as well.

[8]A study by the Ministry of Human Resource Development using a sample of public primary schools from 21 states found that while dropout rates are around 1% from grades 1 to 3, this figure increases to 3% and 7% for grades 4 and 5 respectively.

our tests in a classroom environment.[9]

We conducted surveys on household economic status and parental perception of students' learning achievements for a sub-sample of 5 randomly selected students from each tested grade of all schools. Our household sample has a total of 1499 students.[10] During the school visits, we collected some information on observable school and teacher quality such as pupil teacher ratio and teachers' qualifications. Between October and November 2011, we provided report cards to parents and schools. The test instruments, intervention and report is discussed in details later.

We went back to these 159 schools to conduct two post-intervention surveys in February-March and September-October 2012. The first post-intervention survey (we call this round 1) was in the same academic year while the second (round 2) was in the middle of the new academic year. Hence, students would be promoted a grade in round 2. Before the second post-intervention round, we revisited the household sample to find out each student's enrolment status in the new academic year. We did this in the new year because we do not expect students to change schools in response to our report cards within the same year. We distributed report cards in October and November 2011 and school admissions close from October limiting the ability of students to enrol in new schools in round 1. We could determine the enrolment status of 1485 of the 1499 students in round 2.[11]

As in the baseline, we tried to administer the post-intervention tests in schools including all students present on the day of survey. However, 5 schools did not participate in round 1 and 20 schools did not do so in round 2. The reason most often cited by schools for not participating in our study was ongoing or upcoming examinations. Most schools providing primary education combined upper primary (grades 6 to 8) and secondary (grades 8-12) levels. Still there were 44 schools that were primary-only with grades up to 5. We could not test grade 5 of these schools in round 2 because all students had moved out on being promoted to grade 6. For these non-participating schools and grades, we tested the students selected for the household survey in their homes. Even among the schools that did participate in our study, we could not re-test all students who were there at the baseline because some of them were absent from school on the day of survey.[12] What we did was

[9]We concluded this from the large-scale tests that ASER conducts for students of grade 3. These are administered at home and the test takes more the form of a personal interview between the student and the investigator

[10]Wherever there were fewer than 5 students in a grade, we selected all of them for the household survey.

[11]We could not track the remaining 14 students because their families had moved.

[12]There is substantial seasonal fluctuations in student attendance. Attendance usual peaks in August and September, is low in October and November which coincides with several festivals and then improves in

attempt to administer the follow-up test to at least all students in the household sample. If we could not find a student of the household sample in her school on the day of visit, we traced her to home. We could not, however, give the test to students who were living away from home. In this way, we were able to obtain test scores of at least some students of all schools in round 1 and 158 in round 2. Of the 5155 students who took the baseline test, we have round 1 scores of 3991 students and 2983 students in round 2. Table 1 shows the timeline of our study.

Table 1: TIMELINE

Date	**Activity**	**Data Collected**	**Sample size**
July 2011	Village survey	Village general information School lists	73 villages
Aug-Sep 2011	Baseline surveys	Test scores School general information Household survey	5155 students 159 schools 1499 students
Feb-Mar 2012	Post-intervention survey or Round 1	Student test scores	3991 of baseline students 4835 total students 159 schools
Aug-Sep 2012	Household survey	Enrolment status in 2012 for household sub-sample	1485 of students in household survey
Sep-Oct 2012	Post-intervention survey or Round 2	Student test scores	2983 of baseline students 3939 total students 158 schools 1385 students of household sample

0.3.1 Test instruments

Our tests were designed by an NGO, Bodh Shikshan Samiti, based in Jaipur, which has worked extensively in the field of education in Rajasthan. The questions we use in our tests are from the NGOs question bank of assessment tests. We chose these tests because they are based on the curriculum of public schools in Rajasthan and have been piloted for their relevance for testing learning levels of grades 4 and 5. These tests had three sections to test proficiency of students in Hindi, English and Math. They included Hindi and Math questions meant for grades 1 to 3 and English for grades 1 and 2. Each question was designed to measure certain skills such as word construction, sentence construction and mathematical operations. Within each question type, we added easy and difficult questions to assess the level that a child has achieved. For example- a child should at least be able to solve 3-digit addition and subtraction problems, with carry over, by grade 3. We included these questions

February and March.

as well as questions of 1 and 2-digit operations (level to be acquired by grade 1 and grade 2 respectively) in our tests to be able to identify what the child is capable of doing if she is unable to solve a 3-digit mathematical operation problem. This enabled us to determine if the student has acquired the skills appropriate to her grade or not.

Grades 4 and 5 were each given a different test with questions appropriate for grade 3 forming a relatively higher proportion of the total score for grade 5.[13] In the post-intervention tests, we kept the same questions as the baseline and added an additional question of each type. We kept the difficulty level of the test in rounds 1 and 2 same as the baseline. The test scores in each section were scaled over 100 to make it easier for parents to understand.

A typical day started with survey teams, each consisting of two field assistants, making unannounced visits to schools and requesting permission to conduct the study. We chose to visit schools without prior notice to rule out selection by schools and students. We tried to cover all schools in the same village on the same day, or within a day or two, by sending as many survey teams as the number of schools. The test was given to students wherever their lessons are held regularly within the school premises. Students sat where they usually did although we made sure they were not very close to each other.

All students present in a grade were given a booklet which had separate Hindi, Math and English sections. The test started with the Hindi section, followed by Math and English. The field assistants would explain how to answer each question in a given section from solved examples in the booklet. To control for any instructor biases, a script of the instructions for the students was prepared and strictly followed by each instructor. The same script was followed in each round. Students were then allowed 30 minutes to complete each section of the test. The tests started with the easiest questions i.e. questions that a student who has completed grade 1 should be able to solve and moved on to the more difficult ones. As there were additional questions in the follow-up rounds, we gave students 45 minutes to complete each section. Since some students were tested at their homes during the post-intervention visits, it is possible that the performance of these students may be affected by change in test environment. We tried to follow the same protocol as in schools. An instructor would visit the student's home and request for permission to test the student. Students were tested

[13]Each question carried a score equal to its level, i.e. questions of level 2 carried a score of 2 marks. This was done to enable us to evaluate the quality of answers rather than the answers being correct or incorrect, particularly in language test. For example- in Hindi sentence construction the maximum score was 2 (since a child is expected to be able to write a simple sentence by grade 2). The child got the full score if she wrote a grammatically correct sentence using the word given. If the child wrote a sentence using the word correctly but it was grammatically incorrect overall, the child scored 1 point.

alone and parents and family members were requested to not assist them in any way.

0.3.2 Randomization and Report Cards

We randomized at the panchayat level with all schools within a panchayat receiving similar report cards. We chose panchayats as the unit of randomization to control for spillover of information. Furthermore, we had established that students were more likely to attend schools inside their panchayats. Randomization at this level would help us to limit the possibility of contamination of treatments due to switching of students between treatment groups.

We provided two kinds of report cards- parental and school. Parental report cards were of two types - P1 reported (i) the student's percentage score in each subject (ii) her ranking in class based on her combined score in three subjects. The report card also contained comments on the students' competency such as reading a sentence, solving 2-digit addition problems and so on. We took care to design the parental report cards with coloured graphs so that these could be easily understood by parents who may not be able to read. For instance, we used bar graphs to depict the students rank in class. This did not reveal the names and ranks of other students in the school although parents could easily understand the average performance of the school from the graph. P2 showed (i) the rank of a student among all students and (ii) the relative performance of all schools in the panchayat. This comparison again was based on combined scores. We plotted bars in ascending order of scores of all students in the panchayat and highlighted the target student in the graph. Although the names of other students were removed, students of the same school were marked in identical colours which allowed parents to understand the ranking of every school in the panchayat. Some non-academic comparisons of schools such as observed discipline in schools, teacher absenteeism were also provided in this report card. School report cards were also of two type. S1 reported the average subject-wise score for each grade and the percentage of students who had achieved different levels of competence in reading, writing and numeracy. S2 showed the grade-averaged score in each subject of all schools in the panchayat. Figures 2 to 5 show samples of our report cards.

Table 2 summarises our treatments. Our treatments were of 4 types in which we provided different combinations of parental and school report cards. We call these RC1, RC2, RC3 and RC4 respectively. The parental report cards were given only to students who were selected in the household sub-sample. In RC1, only parents knew how their child and her

grade did in tests but not other schools. In RC2, both parents and schools knew the average school/grade performance. In RC3, schools were informed of their relative performance in the panchayat but not parents. In RC4, both parents and schools had the same information on relative school performance.

Table 2: DESCRIPTION OF REPORT CARDS

	RC0	**RC1**	**RC2**	**RC3**	**RC4**
Report Cards	None	P1	P1+S1	P1+S1 +S2	P1+P2 +S1+S2
Number of village councils	7	7	6	6	6
Number of villages	16	13	16	13	15
Number of schools	35	29	37	28	30
Number of students	1064	859	1319	918	995

P1: (i) Child's percentage score in Hindi, Math and English (ii) Child's total score relative to all students in her class. (iii) Graph showing scores of all students in class but names removed. P2: (i) Child's total score relative to all students in the panchayat (ii) Graph showing total scores of all students in the panchayat with each school marked out (ii) Non-academic indicators such as discipline, number of teachers present. S1: (i) Average grade score in Hindi, Math, English (ii) Percentage of students correctly answering each question. S2: (i) Average grade score of other schools in the panchayat in Hindi, Math and English

The household report cards were delivered to the homes of each student by our surveyors who would discuss the report card in detail with parents or, if the child does not live with her parents, guardians. The report card was discussed in the presence of another educated adult family member often the elder brother or uncle if the parents or guardians were illiterate. We did not discuss report cards of other students with parents. The school report cards were handed over to the school principals.

Parents were informed if schools had received a report card or not but the details of this report card was not revealed to them. Therefore, they were not aware if schools received S1 or S2. Similarly, although we informed schools that some parents received report cards, we did not identify them. However, parents could have shared their report cards with schools and other parents. This meant that even though we were targeting only some households, those parents who did not receive student report cards could easily use these to find out the average school performance. Similarly, teachers could ask students to show their report cards. Schools may even choose to disclose their report cards to parents. Field reports suggested that most schools knew what type of report cards were provided to parents but not vice-versa.

0.4 Data

Table 3 describes our panchayats and villages. Each panchayat is a cluster of 2-5 villages located around 4-5 kilometres of each other. These villages are located away from towns suggesting that urban schools may not enter the choice set of parents, at least at the elementary school level. Although, 85% of our villages have schools (private or public) with upper grades i.e grade 6 to 8 only 27% have a public school with secondary grades i.e grades 9 and above. We constructed a Herfindahl index of competition based on the enrolment share of each school in a panchayat. A market is considered competitive if the Herfindahl index is below 0.25 indicating that our panchayats may have dominant players.

The difference in private and public school scores in our tests stands out. The average score of private schools (combined in Hindi, Math and English) in a panchayat is 219 out of a maximum of 300 while that of public schools is 136. Although private schools do better than public schools in all subjects, the highest difference is seen in English. This suggests that private schools may have a competitive advantage in English. There is considerable variability in test scores of both types of schools. This is mostly *between* schools with high clustering of test scores within schools. The within-school intracluster correlation (ICC) is 0.49 while that of school-grade is 0.52. At the village levels the ICC declines to 0.17 and 0.06 at the panchayat level. This suggests that there was not much variation in test scores within schools but more between schools and within villages and panchayats.

Table 4 describes school and student characteristics. Class sizes were small (around 17 students per class) but the pupil-teacher ratio was high (1 teacher to 32 students) suggesting that a single teacher taught more than one grade. During the school visits we observed if schools had 8 main facilities. Schools had around 70% of these facilities on average. Average fees in private schools was around Rs 1440 per annum. The baseline student sample splits evenly between grades but have a larger proportion of boys. Around 57% of students were enrolled in public schools. From the household sub-sample, we see that around 30% of heads of households were illiterate.[14] To get an idea of household wealth, we calculated the number of assets a household owned out of a total of 11 assets. We find that an average household own 7 out 11 assets (or 64%) suggesting that households may be low to middle socio-economic status.

[14]In most of our households the head is the father. If the father is dead or has been living away from the family for more than 12 months, the head of household is the mother. Around 2% of our students live away from their parents with relatives. In this case, we take the highest education level of any adult in the household as education of household head

Given the indication that competition may be low in our village councils, we want to examine if private and public schools are operating in a segregated market with private schools being selected by the relatively richer households and public schools by the poor. This could have important implications on the amount of competition information provision is able to induce in the education market. Table 5 shows the baseline characteristics of private and public schools. We do not find much difference of school observables although private schools have lower pupil-teacher ratio. The main difference comes from household observables. Private school students are likely to come from better educated and relatively weather families. The household differences persist even with village-fixed effects suggesting that private and public schools may be attracting different types of students in the same village. They ,therefore, may not compete with each other but with others of their kind.

To enable us to compare scores across grades and rounds, we use normalized test scores.[15] We normalize baseline scores to the population mean and standard deviation for each subject and grade. For instance, baseline grade 4 scores in Hindi are normalised with respect to grade 4 mean and standard deviation for Hindi. To normalise the combined score, we use the population mean and standard deviation of the raw combined score. In the post-intervention rounds, we normalise with respect to the mean and standard deviation of the control group since we do not expect the distribution of this group to alter due to our treatments.

Tables A1, A2 and A3 show the variable balance of baseline panchayat, village, school and individual characteristics across treatment groups. We find that schools in RC2 have significantly higher pupil-teacher ratios and RC1 had fewer girls. This could bias the results for these groups. We, therefore, include these characteristics in our regression equation explicitly.

Changing Schools

Table 6 shows the enrolment status of students in 2012 using the household sub-sample. We find that around 17% of students from the household sample changed schools. 7% chose schools outside our sampled villages, mostly in towns or living with relatives or in hostels. Very few students chose schools outside their villages but in the same panchayat. If we exclude grade 5 students in primary-only schools, the proportion of students who changed schools declines to 10%. Of these students, around half chose schools outside our study area.

[15] We assume normality from the Central Limit Theorem as the number of observations is large.

Parental expectations of student outcomes

Around 32% of parents or guardians in our household survey were illiterate. It is ,therefore, reasonable to expect that parents cannot correctly assess the quality of education imparted in schools. To validate this, we asked parents/ guardians if their child could perform some basic language and mathematics tasks which are part of the school curriculum in the household interview. The beliefs of parents regarding their child's performance and their actual performance in our test are shown in Table 7. Columns 1 and 3 show the proportion of parents in private and public schools who said that their child could perform the specified task. Columns 2 and 4 show the actual proportion of students who could perform the task. We find that parents systematically overestimate their child's Hindi and Math performance in both public and private schools, but less so in the latter schools. Parents, however, significantly underestimate their child's English ability in the harder questions. This could be because most parents, having never studied English, cannot correctly assess the abilities of their child. Around 15% of parents responded 'Don't Know' when asked to assess their child's English ability. This suggests that there is substantial mismatch in parental expectations and children's actual capability.

Attrition from Baseline Sample

Attrition is high in our sample. Table 8 shows the percentage of attriters in our baseline sample of 5155 students. Around 16% of students dropped out of the sample in round 1 itself and 27% in round 2. 7% of students were temporary attriters i.e not tested in round 1 but tracked in round 2. These students can be counted as being absent from school on the day we visited. We further see that attrition in both rounds was lower in private schools and those with grades 6 and above. Thus, a number of school characteristics determined how successful we were in tracking students.

Attrition in round 1 could be driven by (1) students who left the sample completely either because they dropped out of school or moved outside our study area, (2) those who were absent on the day of the tests and (3) the 5 schools where we could not test students in school and had to resort to testing students of the household sample in their home. On the other hand, attrition in round 2 could be driven by students who left the sample completely, those that did not turn up at school on the day of test as well as the 20 schools that did not participate in that round and grade 5 in schools with only primary grades. In the second round, we cannot distinguish between the first two categories of attriters as this was the last follow-up.

Differential attrition between experimental groups would bias our estimates of the treatment effect. We test for this in table 0.7 using a probit model. The dependant variable takes value 1 if a student was ever out of the sample, and 0 otherwise. We control for student, school and village baseline characteristics including some variables that could directly affect attrition. These include an indicator variable for non-participating schools, if the school had upper grades and if a village has a public secondary school. We further interact the baseline score of each student with the treatment variables to assess selective attrition based on student quality. This is done separately for private and public schools. Looking at column 1, we see that the coefficients on the treatment variables and their interactions with baseline score are negative and significant in RC2, RC3 and RC4 suggesting attrition was *lower* in these treatment groups. We, further, see that attrition was higher among the low performing students in RC4. Similarly, we find lower attrition in public schools in RC2 and RC3. The predictive power of our model is moderate and we are able to explain 9 and 7 percent of attrition based on observables. Most of our auxiliary variables are significant suggesting that these are good predictors of attrition. Our results suggest that attrition is non-ignorable in our data. We, therefore, use inverse probability weights to address this issue in our estimating strategy.

0.5 Empirical Strategy

Estimating the Impact of Report Cards on Test Scores

Since our study design uses randomized allocation of treatments, we could infer treatment effects by simply comparing the post-treatment average test score across experimental groups. The outcome variable of interest for us is students' normalised combined test score at the end of each post-treatment round. Our estimation strategy is given by,

$$Y_{ipt} = \alpha_0 + \sum \beta_{0k} RC(k)_p + \phi_0 Y_{ip0} + \epsilon_{ip} \tag{1}$$

Here Y_{ipt} is the score of student i in panchayat p in post-intervention round t, t=1,2. $RC(k)_p$ take value 1 if panchayat p is in treatment group, k=1,2,3,4. Following Todd and Wolpin (2003) and Andrabi et al. (2011), we include Y_{i0} or the baseline score of student i as a control variable. Gains in test scores in time t is determined by not only educational inputs in that

period but also the entire history of inputs that provided the basic knowledge. Having the baseline score as an independent variable accounts for the achievement that the student already has at time t. ϵ_{ip} is the idiosyncratic error term. With randomization, the estimate of the treatment effect is given the coefficients of $RC(k)_p$. While the coefficients of each treatment variable would indicate the impact of the treatment compared to the control group, we can estimate the value-added by the additional information in each treatment as well. The difference between the coefficients of two consecutive treatments can be interpreted as the effect of the additional information in the latter treatment. For instance, in RC1 we provided parents with report cards P1. In RC2, parents got P1 and schools got S1. The difference between the coefficients of RC2 and RC1 can be interpreted as the incremental impact of S1. Standard errors are clustered at panchayat level.

Our estimates from equation (1) are likely to be biased as we have non-random attrition. Our preferred estimation technique re-estimates this equation with inverse probability weights suggested by Moffit et al. (1999) and Baulch and Quisumbing (2010) to correct for the attrition determined by observables. Intuitively, this method gives more weight to students who are similar on baseline observables to attriters than to students who stay in the sample. We first estimate the following probit model:

$$R_{ipt} = \alpha_1 + \sum \beta_{1k} RC(k)_p + \phi_1 Y_{ip0} + \delta X + \gamma\psi + \nu_{ip} \tag{2}$$

Here R_{ipt} is an indicator of retention which takes values 1 if student i was tested in post-treatment round t and 0 if not. Apart from having the treatment indicators and controlling for baseline characteristics, we add a vector of auxiliary variables ψ that are related to attrition. These are different from instrumental variables as they can be related to the outcome variable. We use the four auxiliary attrition variables described in table 0.7 in our estimation. In table A4 in Appendix, we show that these variables were not correlated with the school's treatment status and most baseline characteristics. We assume that ν_{ip} and ϵ_{ip} are uncorrelated.

We next estimate equation (2) without the attrition variables:

$$R_{ipt} = \alpha_2 + \sum \beta_{2k} RC(k)_p + \phi_2 Y_{ip0} + \delta X + \mu_{ip} \tag{3}$$

The ratios of the predicted values of equation (3) and (2) give the inverse probability weights:

$$W_i = p_{res}/p_{unres} \tag{4}$$

Inverse probability weights would only correct for attrition determined by observable characteristics. If there is selection on unobservables, this method would be inadequate. In that case, we would have liked to use a Heckman specification model. However, we do not have an appropriate instrumental variable to explain attrition.

We estimate equation (1) with weights separately for rounds 1 and 2 and by private and public schools. In each round, we restrict our sample to students present at the baseline and in the post-intervention round of interest. Therefore, the student sample changes in each round. For instance, the sample in round 2 includes students who were present in all three rounds as well as those who may have been absent in round 1 but present in round 2. The school sample,however, remains the 158 schools covered in round 1 and 2. Later, we present our results for the restricted sample of students present in all rounds. We further present results for the all students who took the test including new entrants in each round by dropping baseline test score from this equation.

Since we see some differences in baseline characteristics across our groups we analyse equation (1) with controls for student, school and village characteristics. Besides the treatment indicators and baseline student score, we consider gender and grade of the student, baseline pupil-teacher ratio, class size, an indicator of school facilities, adult male literacy rate and number of schools in a village, herfindahl index of school competition at the panchayat level and a dummy for village development block.

Estimating the Impact of Report Cards on Absenteeism

One possible response to feedback on student performance is change in effort levels by parents. Studies have measured parental effort in terms of time spent in monitoring, helping in homework and private inputs such as tuitions. We use a different measure of effort, namely, student attendance. Informing parents of their children's actual learning achievements may cause them to alter their school participation depending on the feedback they receive. We estimate a probit model to analyse the impact of report cards on student absenteeism. The basic equation remains the same as (1) but, here, the dependant variable takes a value 1 if a student was not tested in round 1 but was tracked in round 2, and 0 otherwise. This can

be used as an indicator of absenteeism as we probably could not test the student because they had not come to school on the day of our visit. With limited possibility of students switching schools in the same academic year, these students were still likely to be enrolled in the same schools. Of the 362 students who form this group, 344 were found enrolled in the same school in round 2.

Estimating the Impact of Report Cards on School Choice

We use the household sub-sample of 1485 students who we could trace in subsequent household surveys to study the impact of report cards on school choice. The choice of schools for young children is taken entirely by parents. Since all our treatments gave some form of report card to parents, we look at the combined effect of all of them on school choice. We look at the percentage of students in a grade who have changed schools in 2012. This includes students who may have switched to schools in our sample as well as those who may have chosen urban schools. Since students in grade 5 of primary-only schools would have changed schools even without our treatments, we exclude these grades from our analysis. We estimate,

$$C_{cjp} = \alpha_3 + \beta_3 RC_p + \delta_3 X + \varepsilon_{cj} \tag{5}$$

Here C_{cjp} is the percentage of students in grade c in school j in panchayat p who changed school in 2012. RC_p takes value 1 if panchayat p received a report card. We are interested in the coefficient of RC_p which can be interpreted as the combined effect of our treatments.

While information provision may induce parents to change schools, we are also interested in learning if this enabled them to choose the better schools. We compare the change in ranks of schools for those switching schools in 2012. We first compute the difference in the baseline rank of a student's school in 2011 and that of the school chosen by her in 2012. Since schools with higher numerical rank are the worse schools, we then take the negative of this difference. Therefore, a student who switched from a school ranked 6 to one that had a baseline rank of 2 would have gained 4 ranks. We know the ranks of only those students who switched to schools within our sample. We, therefore, exclude those who moved outside our study area. Our estimating equation takes the same form as equation 1 but the dependant variable is the gain in rank between rounds. As before, we are interested in the coefficients of $RC(k)_p$.

0.6 Results

0.6.1 Effect on test scores

We first report our estimates of the impact of report cards on test scores at the end of the same academic year, or round 1 in table 10. The sample is restricted to the students tested at the baseline and round 1. Columns 1 to 3 show the results for private schools while columns 4 to 6 do so for public schools. For each of these, we present the weighted estimates without and with controls. This is followed by the unweighted estimates. Looking at the results for private schools in column 1, we see that the coefficients on the treatment variables are mostly insignificant except the coefficient of RC2 which is 0.23 and weakly significant (p=0.07). Adding controls does not improve our results.

In the bottom panel, we report the F-stats of other tests of significance. We see that the treatment coefficients do not appear to be jointly statistically different from zero. None of the incremental effects are significant except that of RC3 over RC2 (significant at 10%). Looking at column 4, we see a weak negative impact of RC1 on public school test scores. This disappears when we add controls. We do not see any impact of RC2, RC3 and RC4 on test scores of public school students in any specification.

We next discuss the impact of report cards on test scores in the beginning of the new year, or round 2, in table 11. The sample includes the students who were tested at baseline and round 2. Looking at the results for private schools in column 1, we find that test scores improved by 0.22 SD in RC4. We do not find any impact of the other treatments. Our treatment variables are, however, jointly significantly different from zero. Adding controls alters our results somewhat. While the coefficients of RC1 and RC3 remain insignificant, the coefficient of RC2 increases in magnitude and significance to 0.30 SD. The coefficient of RC4 increases to 0.29 SD. Given that there were some difference in baseline characteristics across treatment groups, adding controls may improve the precision of our estimates. We further see that the coefficients of the weighted and unweighted estimates are different suggesting that probability weights do correct for some part of the attrition.

Looking at the p-values of the incremental impacts in the bottom panel, we see that although the impact of RC2 was significant it was not statistically different from RC1. This suggests that providing school absolute report cards had no differential impact over providing parental report cards. Next, we see that the difference between RC3 and RC2 is negative

and significant. Compared to control villages, private schools in RC3 did not improve test scores. However, compared to RC2 the gains were lower in RC3. Moving on to our final treatment, the difference between RC4 and RC3 is significant and positive. The additional information in RC4 over RC3 is relative school performance to parents. Since we found no impact of RC3 on test scores, we can conclude that the impact seen in RC4 is driven by this information to parents. We do not see any impact of our treatments on public school scores.

In table 12 we restrict the sample to students who were present in both post-intervention rounds. In column 1, we see that the modest effect of RC2 on private school scores in round 1 does not hold up in this sample and we find no effect of any treatment on test scores in this round. The results for round 2 show an increase of 0.27 SD in RC2 but this is only weakly significant (p=0.08). This effect is also not statistically different from the insignificant effect in RC1. In this round, we do not find any impact of RC3 but this effect was significantly lower than the effect of RC2. RC4 led to an increase in private school test scores by 0.23 SD. As earlier, we do not see any impact on public school scores.

In table 13 we report our results keeping private and public schools in the same regression and dropping baseline scores. In all our specifications, this makes the constant term significant. In columns 1 and 2, we focus on the results for the student panels. The pattern of effects on the scores of private school students does not change. We do not see any effect on scores in round 1. In round 2, we find a significant positive effect of RC4- test scores increased by 0.30 SD. This is higher than the what we had observed in column 1 of table 11. On the other hand, there was a negative effect of report cards on public school scores in round 1 because of RC1. Columns 3 and 4 report the results for the pooled sample of students in each round. Again we see a negative impact on public school scores in round 1 for RC1. We see a modest positive effect on private school score in RC4 but this is not significantly different from the impact of public school scores. The dissimilarity of results between the panel and pooled student sample could be driven by systematic differences in students who may not be present at the baseline but may have enrolled in the follow-up rounds. Additionally, we had seen earlier that our treatments reduced attrition. If the worse students were retained in our treatment schools and these students do not respond to information immediately, the overall estimates may be lower than the student panel.

The overall impacts that we see in the above tables may be hiding heterogenous impacts by the baseline score of students. Since we do not see any indication of average impact on test scores in round 1, we examine this for test scores in round 2 in table 14. We classify

students into 3 groups based on their percentile rank in class at baseline- between 25 to 75th, below 25th and above 75th percentiles. Here, we find some indication of positive impacts of RC1 and RC2 on scores of private school students who were between 25th and 75th percentile. The coefficient of RC1 and RC2 for these students are 0.18 and 0.27 respectively although these are weakly significant (p= 0.08 and 0.06). Moreover, they do not appear to be statistically different from one another suggesting that there may not be any incremental effect of RC2. We do not see any significant overall or incremental impact of RC3. We find that the highest impact was in RC4 where test scores improved by 0.29 SD. Compared to RC3, the incremental impact of RC4 was 0.19 SD.

Moving to column 2, we observe a significant negative impact of RC3 on students ranked in the bottom of their class suggesting that when private schools are informed of their rank there is a decline in test scores of the worse students. The overall impact of RC4 for students in this group is insignificant but its incremental effect over RC3 is 0.55 SD. This suggests that providing relative school information to parents in RC4 alone had a high impact on test scores. The positive incremental effect of RC4 is also seen for students ranked high in their class. We do not find any significant impacts on test scores of public school students. The coefficient of the treatment variables for public schools are jointly equal to zero suggesting that none of the treatments had any impact on test scores.

0.6.2 Effect on attendance

Table 15 shows the impact of report cards on student absenteeism in round 1. Here the dependant variable takes a value 1 if a student was not traced in her school in round 1 but was found in round2. Columns 1 and 2 report the results for private and public schools respectively. We see that provision of report cards reduced absenteeism in private schools. The marginal effects are -0.05, -0.055 , -0.03 and -0.04 for the four treatment groups respectively. These can be interpreted as the probability of a student being absent in a treatment group relative to the control group. Thus, the probability of a student in RC1 being absent was lower than one in the control group by 0.05. Looking at column 2, we see that students in public schools in RC2 and RC3 were more likely to be absent. Our results could be driven by the 5 schools where we could test students at school. We exclude these schools and report the results in columns 3 and 4. While the marginal impacts on private school students remains unchanged, we find that the high absenteeism we found in public schools disappears in this sample. This suggests that the decrease in absenteeism was consistent in private school while this was mostly unchanged in public schools.

0.6.3 Effect on school choice

Table 16 shows the results of equation (5). This is a grade-level analysis in which we exclude grades 5 of schools that do not house grades 6 and above. Column 1 shows the effect of getting *any* report card on the proportion of students changing schools. The coefficient on the treatment variable is 0.062. This suggests that the proportion of students who changed schools in treatment groups was greater than that in control schools by about 6 percentage points. Moreover, this effect was driven by students in public schools. We see no impact on private schools. Going on to columns 4 and 5, we want to explore if providing school rankings to parents had any differential impact on changing schools. We club together treatments RC1 to RC3 where parents did not receive school ranks and compare the effects on this combined group and RC4. We find the proportion of public school students who changed schools in RC4 was higher by 9 percentage points. On the other hand, we do not find any significant effect on public schools in the groups where parents were not given relative school information. We see no effect on private schools.

Table 17 shows the impact of report cards on the gain in rank due to school change. We see that in RC4 where we provided the school ranks to parents there was a significant improvement in the rank of chosen schools. This was driven primarily by students of private schools where the average gain was 0.19 ranks. For public schools, the point estimate of the coefficient of RC4 was higher than the other treatments combined but this was not significant. Thus, although higher proportion of students in public schools changed schools, they did not choose the very high ranking schools. We should interpret these results subject to the caveat that the samples in tables 16 and 17 are not comparable. While the sample in table 16 includes all students in the household sample whose enrolment status was known, table 17 excludes those students who enrolled in schools outside our study area.

0.7 Discussion

In this study, we sought to increase the level of knowledge on the quality of education by providing different types of report cards to parents and schools. We varied report cards by recipients (parents or schools) and the level at which this information was bundled. We then analysed the responses of recipients by studying educational outcomes at the end of the same academic year and, then, in the subsequent year. We see very different responses from private and public schools.

We first discuss the results for private schools. The immediate response to information provision was an decline in student absenteeism. We were significantly more likely to find students in their respective schools at the end of the year in villages where report cards were distributed. This can interpreted as an indicator of parental (or student) effort levels. Although lower absenteeism was a favourable outcome, it introduced selective attrition in our sample. We attempt to address selection on observables using inverse probability weights to estimate the impact of report cards on test scores.

We do not see any improvement in test scores in the same year. The impacts of our treatments manifest in the new year. We find that test scores improved significantly in the fourth treatment. In this treatment we informed parents of the position of their child relative to all others students in the panchayat as well the ranks of every school. Schools got a report card in which their performance was compared with other schools in the panchayat. Test scores improved by 0.22 SD to 0.29 SD as a result of this treatment. These results are consistent across a number of specifications. Certain factors could work towards making this treatment the most powerful. First, making the relative performance of every school explicit to parents may increase pressure on schools to improve quality. Since parents may share their report cards with schools, we can make the assumption that schools knew the kind of report cards being given to parents. In a scenario where there are ample schooling options and public schools that are free, this would put pressure on poorly ranked private schools to improve quality. Schools ranked marginally better may improve quality as they are aware that parents have other choices. Second, parents may increase their own and their child's effort towards learning. This could take the form of better monitoring as well as reallocating household inputs to a child's education such as private tuitions. In this study, we observe that there was an increase in the regularity of school participation of students as a result of our report cards. Third, there is some evidence to indicate that parents chose higher ranked schools which could lead to better outcomes.

The overall impacts of the first, second and third treatments are insignificant but there are some nuanced impacts. Providing information to parents on their child's absolute score, rank in class and school absolute performance in the first treatment improved test scores of students who were between 25 to 75 percentile in their class by 0.18 SD. When this treatment is combined with a school report card in which the absolute performances of each grade is reported, the impact on middle-ranked students increases to 0.27 SD. We do not see any impact on similarly ranked students in the third treatment while that in the fourth treatment was 0.29 SD. Thus, with the exception of the third treatment, we find that the magnitude of our impacts increase as we provide additional information. However, the impacts of the first

and second treatments are not statistically different which suggests that providing schools with the additional information on their own performance did not have any extra benefit. We do not see any impact of on test scores of low and high-performing students in any treatment except for a decrease for low-ranked students in the third treatment.

The absence of any significant improvement in the third treatment where schools are informed of their relative positions in the panchayat may not be completely unexpected. Panchayats on average had 5 schools while the average rank of private schools was 1.8. Given their high rank in a panchayat, these schools may choose to compete on margins other than quality. This may offset the positive impact of the parental report cards. Note that , if we view attendance as an indicator of parental or student effort, we find that student attendance improved in this treatment as well. Our results are similar to Andrabi et al. (2014) who show that private schools with high academic scores respond by increasing fees in response to an information campaign in Pakistan. Another possible explanation would be that schools already have a fair idea about their relative rankings in the panchayat and we did not add to their information set. The interpretation of this result would also depend on the latent competitiveness in the school market which was low in our villages.

The difference in gains by baseline performance has implications on the role of feedback in influencing outcomes. The potential gains for students at the top of the class distribution (above 75th percentile) may be low given that they start from a high baseline score. It is, therefore, not surprising that these students do not improve test scores significantly. On the other hand, low ranked students may not be able to increase test scores as these students were probably from relatively worse off households where parental efforts to improve learning may be limited. Some lab and field experiments have provided evidence that relative performance feedback within an organisation may cause poor-performers to reduce effort or not improve efforts as much as high-performing peers. For instance, Kuhnen and Tymula (2012) find that, when provided with relative performance feedback, subjects who were in the top and middle of the distribution in a task that required them to solve math problems increased effort levels. However, those who were at the bottom third of the distribution gained much lower than those at the top and middle of the distribution. Barankay (2012) uses a randomized experiment in which removal of relative feedback increased sales performance of furniture salespersons. Ashraf et al. (2014) show that comparison of performance of trainee nurses in Zambia had a negative impact on their test scores in a training program, especially among the low-ability trainees. In our treatments, we see that low-ranked students either did not gain significantly or saw a decrease in test-scores.

Our results also indicate that information to parents may be more effective in improving learning outcomes than to schools. Providing schools with absolute performance feedback in the second treatment did not lead to any significant incremental impact over parental report cards. Similarly, the impact seen in the fourth treatment was due to informing parents of relative school quality.

Our results for public schools are in contrast to that observed in private schools. We do not find any change in absenteeism due to our treatments. We do find that a significantly higher proportion of students changed schools when parents were given school choice. However, we do not see an significant improvement in the rank of the new schools. Although it may seem like parents were not choosing the better schools, we can argue that students in public schools face stricter budget constraints. Being from economically worse off families, these students may not be able to afford high ranked schools (which in most cases are private schools). We see no significant improvement in test scores of public school students. This finding echoes that by Banerjee et al. (2008) who see no effect of community level information campaigns on public school learning outcomes. They argue that, apart from lack of financial pressures, the ability of public schools to improve services may be limited as school principals have little control on the choice of teachers and reallocation of schools resources. Furthermore, beneficiaries may be able to put pressure on public schools to improve quality only if they were involved in the school's management. Public schools are required to have school management committees comprising of parents, village officials and teachers. However, the responsibilities of these committees is restricted to overlooking expenditure on programs that are not directly related to improving teaching in schools.

Our study concludes that information provision is effective in improving the quality of education in private schools. We do not see the same impact on public schools. However, both types of schools face distinct resource constraints and attract very different students. It may, therefore, be unwarranted to compare these schools. For instance, private school students in our sample come from economically better-off families that enables them to choose from a wider range of schooling options. On the other hand, these schools may be unaffordable to students enrolled in public schools. Parents of students in private schools are better educated than those in public schools. They may be able to respond to information better and faster than less educated parents. Our results suggest that our effects were driven by providing information to households. However, we fall short of explaining the mechanism through which the improvement in test scores is realized. We hope to explore this further.

Table 3: BASELINE VILLAGE COUNCIL (PANCHAYAT) AND VILLAGE CHARACTERISTICS

	N	Mean	Std. Dev
Panchayat Characteristics			
Panchayat average pvt. school Hindi score (max=100)[a]	30	71.99	10.25
Panchayat average pub. school Hindi score (max=100)[b]	30	44.75	7.73
Panchayat average pvt. school Math score (max=100)	30	70.76	9.34
Panchayat average pub. school Math score (max=100)	30	47.67	7.67
Panchayat average pvt. school English score (max=100)	30	76.98	10.17
Panchayat average pub. school English score (max=100)	30	43.53	10.99
Panchayat average pvt. school Combined score (max=300)[c]	30	219.73	28.12
Panchayat average pub. school Combined score (max=300)	30	135.96	24.47
Index of school competition[d]	32	0.27	0.08
No. villages in panchayat	32	2.44	1.11
Village Characteristics			
No. schools in village	73	2.22	1.37
No. private schools in village	73	0.89	0.96
Average distance from nearest town	73	14.44	7.28
Village has any upper-primary school	73	0.85	0.36
Village has a public secondary school	73	0.27	0.45
% of SC persons	73	.006	0.027
% of Literate adult males	73	0.70	0.12
% of Health facilities (out of 4)[e]	73	0.35	0.17

a: The test scores are scaled over 100 for each subject. Two village councils did not have private schools. *b*: Public schools in two pachayats had no enrolment in grades 4 and 5. *c*: The combined score is the sum of the percentage score in each subject. Therefore, the maximum is 300. *d*:This is the herfindahl index based on the shares in enrolment in grades 4 and 5 of schools for each panchayat. This is calculated as $\sum {s_i}^2$ where s_i is the proportion of grade 4 and 5 students enrolled in school i of a panchayat. The index is positively correlated with market concentration. *e*: This the number of health care facilities in a village over a maximum of 4. These facilities included ICDS centre, dispensary, primary health centre, pharmacy.

Table 4: BASELINE SCHOOL AND STUDENT CHARACTERISTICS

	N	Mean	Std Dev
School Characteristics			
% Public school	159	0.59	0.49
Class size	159	17.04	9.82
Private school rank in village[f]	65	1.48	0.71
Public school rank in village	94	2.39	1.37
Total enrolment in school	159	199.28	121.22
Pupil-teacher ratio	159	31.13	12.24
Annual fees in private schools	65	1436.33	1065.10
% of school facilities (out of 6)[g]	159	0.71	0.15
Student Characteristics			
% in public schools	5155	0.57	50
Girls	5155	0.41	0.49
Grade 5	5155	0.49	0.50
Student Characteristics obtained from household survey			
Education of head of household			
(i)Illiterate	1499	0.32	0.47
(ii)Grade 1-5	1499	0.14	0.35
(iii)Grade 6-10	1499	0.49	0.50
(iv)Grade 11- College	1499	0.05	0.22
% of household assets(out of 11)[h]	1499	0.64	0.17
% of students taking home tuitions	1499	0.055	0.23

f: School rank in village is determined by the average combined score of the school. *g*: This is the number of facilities in a school expressed as a percentage of a total of 6 main facilities. These facilities are pucca school building, functional toilets, drinking water facility within school premises, separate office, students per classroom being less than 35 and teacher to classroom ratio greater than 1. *h*: This is the number of assets a household owns expressed as a percentage of a total of 11 assets. These include owner occupied house, pucca building, cemented flooring, piped water in house, transport such as four wheeler or two-wheeler, TV, refrigerator, electric fans, mobile phone and electricity connection.

Table 5: DIFFERENCES BETWEEN PRIVATE AND PUBLIC SCHOOLS

	A. School Characteristics					
	Class Size	**Total Enrolment**	**% School Facilities (out of 6)**	**Pupil-Teacher Ratio**	**Graduate Teachers**	**Teachers Present**
Public (N=91)	16.21	188.33	0.72	33.02	0.76	0.86
	(1.04)	(14.01)	(0.01)	(1.32)	(0.03)	(0.02)
Private (N=65)	18.34	216.94	0.70	29.30	0.79	0.88
	(1.23)	(12.85)	(0.02)	(1.40)	(0.03)	(0.02)
Difference	2.13	28.61	-0.02	-3.71	0.03	0.02
	(1.61)	(19.88)	(0.02)	(1.97)*	(0.04)	(0.03)
	B. Student Characteristics					
	Education of Household Head				**% Household Asset (out of 11)**	
	Illiterate	**Grade 1-5**	**Grade 6-10**	**Grade 11-College**		
Public (N=847)	0.390	0.173	0.415	0.019	0.604	
	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	
Private (N=612)	0.215	0.101	0.588	0.092	0.697	
	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	
Difference	-0.175	-0.072	0.173	0.073	0.093	
	(0.02)***	(0.02)***	(0.03)***	(0.01)***	(0.01)***	

Notes: This table compares the school and student characteristics of public and private schools. Since, we could observe teacher absenteeism for only 155 schools we restrict the sample to these schools. The student characteristics come from the household survey of 1459 randomly selected students from the same 155 schools. Please see table 4 for definition of variables. Standard errors in parenthesis. Significance *** 1% **5% *10%

Table 6: PERCENTAGE OF STUDENTS BY ENROLMENT STATUS IN 2012

	Household Sample	
	(1)	(2)
Total students	1485	1321
(In percentage terms)		
Dropped out	1.21	0.98
In the same school	82.15	89.33
Changed to school in village	7.00	3.63
Changed to school in panchayat	2.63	1.51
In a different school outside sample	7.00	4.54
Grade 4	Yes	Yes
Grade 5	Yes	Schools with upper grades

Notes: This table shows the enrolment status of students in 2012 using the household sub-sample. It excludes 14 of the 1499 students whose families could not be located in the same village.

Table 7: PARENTAL EXPECTATION AND STUDENTS' ACTUAL PERFORMANCE

	Public Schools		**Private Schools**	
	Parental Expectation	**Students' Actual Ability**	**Parental Expectation**	**Students' Actual Ability**
Recognize Hindi alphabet	93.16	80.66	99.68	95.54
Construct a Hindi word	88.44	85.02	98.56	95.69
Construct a Hindi simple sentence	54.83	51.18	88.26	85.54
Comprehend a simple Hindi story	44.46	42.33	78.42	63.23
Count	93.51	79.95	99.37	92.92
Perform 2-digit mathematical operation with no carry over	80.78	70.28	96.49	90.62
Perform 3-digit mathematical operation with no carry over	57.08	27.95	84.54	61.85
Recognize English alphabets	42.22	88.33	79.89	97.08
Construct an English word	37.38	66.51	75.09	91.85

Notes: This table compares parental expectations and students' actual performance based on responses and test scores of 1499 students and households. This is done separately for public and private schools. Parental expectation is measured as the percentage of parents who responded "Yes" when asked if their child could perform a specific scholastic task. Student performance is measured as the percentage of students who could do the task at the baseline.

Table 8: ATTRITION

	All Schools	**Schools with grades 6+**	**Private**	**Public**
Total Students	5155	4226	2230	2925
Attrited in Round 1	802 (15.56)	688 (16.28)	243 (10.90)	559 (19.11)
Attrited in Round 2	1370 (26.58)	1046 (24.78)	632 (28.34)	738 (25.23)
Present Round 2 but not Round 1	362 (7.02)	327 (7.74)	133 (5.96)	229 (7.83)
Present both rounds	2621 (50.84)	2165 (51.23)	1222 (54.8)	1399 (47.83)

Notes: Figures in parenthesis display percentage of total students.

Table 9: PROBIT ESTIMATES OF ATTRITION FROM BASELINE STUDENT SAMPLE

	Private	**Public**
	(1)	(2)
RC 1	-0.216	-0.087
	(0.159)	(0.139)
RC 2	-0.324***	-0.209*
	(0.125)	(0.109)
RC 3	-0.372***	-0.292***
	(0.121)	(0.093)
RC 4	-0.234	0.071
	(0.152)	(0.093)
Baseline*RC 1	-0.159	-0.057
	(0.125)	(0.141)
Baseline*RC 2	0.025	-0.084
	(0.125)	(0.104)
Baseline*RC 3	-0.008	-0.143*
	(0.131)	(0.076)
Baseline*RC 4	-0.282***	-0.039
	(0.108)	(0.077)
Main Controls		
Baseline score	-0.116	-0.139**
	(0.089)	(0.070)
Girl	-0.087	0.059
	(0.080)	(0.038)
Class 5	0.905***	0.631***
	(0.177)	(0.144)
Pupil-Teacher ratio	0.009***	0.003
	(0.003)	(0.004)
Class size	0.023***	0.025***
	(0.004)	(0.005)
No. school facilities	0.652**	-0.039
	(0.288)	(0.165)
Village male literacy	0.234	-0.042
	(0.494)	(0.353)
No. school in village	0.034	0.015
	(0.024)	(0.027)
Panchayat HH index	0.368	-0.654*
	(0.730)	(0.394)
Contd..		
PS dummy	0.335*	0.176**
	(0.202)	(0.086)
Auxilliary Variables		

School participated in both rounds	0.616***	0.708***
	(0.127)	(0.105)
Class 5* School has grade 6+	-0.783***	-0.680***
	(0.198)	(0.159)
School has grade 6+	0.325***	0.108
	(0.121)	(0.135)
Village has public secondary school	0.119	-0.007
	(0.081)	(0.085)
Constant	-1.921***	-0.691*
	(0.474)	(0.407)
Observations	2230	2909
Pseudo R^2	0.095	0.078

Notes: This table shows the probit estimates of attrition from the baseline student sample of 158 schools which we could cover in all 3 rounds. There were 5139 students in these schools at the baseline. Attrition for private and public schools is shown in separate columns. The dependant variable takes value 1 if a student was not found in either round 1 or 2 or both and 0 otherwise. We control for two broad categories of variables. The main controls are baseline characteristics that could influence test scores as well as attrition. The auxiliary variables impact attrition but may not be directly related to baseline test scores. These are are indicator variables if a school participated in both follow-up rounds, if a school had upper grades and its interaction with Grade 5 dummy and if the village had a public middle school. Standards errors are clustered at the panchayat level. Significance level ***1% **5% *10%.

Table 10: IMPACT OF REPORT CARDS ON TEST SCORES IN THE SAME ACADEMIC YEAR

Dependant variable	**Normalized combined score in Round 1**					
	Private Schools			**Public schools**		
	Weighted		**Unweighted**	**Weighted**		**Unweighted**
	(1)	(2)	(3)	(4)	(5)	(6)
RC 1	0.082	0.059	0.061	-0.316*	-0.208	-0.274
	(0.095)	(0.116)	(0.119)	(0.157)	(0.189)	(0.166)
RC 2	0.231*	0.237*	0.237*	-0.138	0.084	-0.010
	(0.113)	(0.132)	(0.134)	(0.181)	(0.197)	(0.174)
RC 3	0.020	0.017	0.019	-0.276	-0.135	-0.208
	(0.122)	(0.113)	(0.118)	(0.232)	(0.175)	(0.160)
RC 4	0.010	0.008	0.008	-0.184	0.005	-0.073
	(0.082)	(0.103)	(0.106)	(0.235)	(0.221)	(0.203)
Baseline score	0.723***	0.714***	0.717***	0.750***	0.768***	0.789***
	(0.041)	(0.043)	(0.043)	(0.056)	(0.046)	(0.042)
Constant	-0.154*	0.111	0.108	-0.048	-0.726	-0.728
	(0.083)	(0.487)	(0.493)	(0.129)	(0.682)	(0.627)
F-stat of tests of significance						
Joint significance of RCs	1.353	1.434	1.479	1.108	1.134	1.417
	[0.274]	[0.248]	[0.234]	[0.371]	[0.360]	[0.253]
RC2=RC1	1.796	2.435	2.425	1.150	2.984	3.099
	[0.191]	[0.130]	[0.130]	[0.292]	[0.095]	[0.089]
RC3=RC2	2.429	3.878	3.824	0.335	2.543	2.436
	[0.130]	[0.059]	[0.060]	[0.567]	[0.122]	[0.129]
RC4=RC3	0.007	0.011	0.021	0.103	0.485	0.467
	[0.933]	[0.916]	[0.886]	[0.751]	[0.492]	[0.500]
Controls	No	Yes	Yes	No	Yes	Yes
Obs	1854	1854	1854	2127	2127	2127
R^2	0.466	0.487	0.489	0.362	0.405	0.434

Notes: This table shows results of estimating equation 1 where the dependant variable is the normalised combined student score in round 1. The sample is restricted to 3991 students present at baseline and round 1. We estimate this equation separately for private and public schools. For each type of school, we first report the weighted estimates of the treatment variables *RCs* without and with baseline controls i.e columns 1, 2, 4 and 5. In columns 3 and 6, we report the unweighted estimates. Student-level controls include student baseline score, a grade dummy and gender. We control for school characteristics such as pupil-teacher ratio , class size and number of school facilities. Village controls include male adult literacy and number of schools in the village. Panchayat variables include an index of school competition and development block dummy. In the lower panel, we report the F-stats of the tests of joint significance and incremental effects across treatment groups. Standard errors clustered at panchayat-level are in parenthesis. P-values of F-stats in brackets. Significance *** 1% **5% *10%.

Table 11: IMPACT OF REPORT CARDS ON TEST SCORES IN THE NEW ACADEMIC YEAR

Dependant variable	**Normalized combined score in Round 2**					
	Private Schools			**Public schools**		
	Weighted		**Unweighted**	**Weighted**		**Unweighted**
	(1)	(2)	(3)	(4)	(5)	(6)
RC 1	0.122	0.123	0.117	-0.172	-0.167	-0.207
	(0.087)	(0.114)	(0.106)	(0.203)	(0.195)	(0.204)
RC 2	0.175	0.302**	0.244	-0.055	0.060	0.007
	(0.130)	(0.147)	(0.153)	(0.183)	(0.168)	(0.166)
RC 3	-0.045	-0.008	-0.058	-0.166	-0.057	-0.056
	(0.087)	(0.090)	(0.094)	(0.123)	(0.132)	(0.130)
RC 4	0.223**	0.289**	0.231**	0.015	0.034	-0.021
	(0.098)	(0.110)	(0.109)	(0.126)	(0.129)	(0.112)
Baseline score	0.589***	0.575***	0.582***	0.547***	0.576***	0.597***
	(0.051)	(0.050)	(0.047)	(0.052)	(0.053)	(0.053)
Constant	-0.085	-0.225	-0.307	-0.073	0.307	0.483
	(0.090)	(0.603)	(0.582)	(0.105)	(0.756)	(0.752)
F-stat of tests of significance						
Joint significance of RCs	4.446	6.332	6.792	1.068	0.532	0.394
	[0.006]	[0.001]	[0.001]	[0.390]	[0.713]	[0.811]
RC2=RC1	0.224	2.577	1.314	0.257	1.504	1.180
	[0.639]	[0.119]	[0.261]	[0.616]	[0.230]	[0.286]
RC3=RC2	3.671	8.080	7.377	0.459	0.476	0.124
	[0.065]	[0.008]	[0.011]	[0.503]	[0.496]	[0.727]
RC4=RC3	12.879	21.649	20.493	3.484	0.459	0.069
	[0.001]	[0.000]	[0.000]	[0.072]	[0.503]	[0.794]
Controls	No	Yes	Yes	No	Yes	Yes
Obs	1355	1355	1355	1628	1628	1628
R^2	0.317	0.340	0.355	0.209	0.253	0.272

Notes: This table shows results of estimating equation 1 where the dependant variable is the normalised combined student score in round 1. The sample is restricted to 2983 students present at baseline and round 2. We estimate this equation separately for private and public schools. For each type of school, we first report the weighted estimates of the treatment variables *RCs* without and with baseline controls i.e columns 1, 2, 4 and 5. In columns 3 and 6, we report the unweighted estimates. Student-level controls include student baseline score, a grade dummy and gender. We control for school characteristics such as pupil-teacher ratio , class size and number of school facilities. Village controls include male adult literacy and number of schools in the village. Panchayat variables include an index of school competition and development block dummy. In the lower panel, we report the F-stats of the tests of joint significance and incremental effects of treatment groups. Standard errors clustered at panchayat-level are in parenthesis. P-values of F-stats in brackets. Significance *** 1% **5% *10%.

Table 12: ROBUSTNESS CHECK: IMPACT OF REPORT CARDS ON TEST SCORES

	Round 1		**Round 2**	
	Private	**Public**	**Private**	**Public**
	(1)	(2)	(3)	(4)
RC 1	0.039	0.011	0.092	-0.059
	(0.104)	(0.219)	(0.116)	(0.195)
RC 2	0.183	0.078	0.268*	0.096
	(0.153)	(0.232)	(0.147)	(0.173)
RC 3	-0.056	-0.050	-0.058	-0.046
	(0.108)	(0.200)	(0.088)	(0.132)
RC 4	-0.083	0.112	0.234**	0.094
	(0.103)	(0.247)	(0.109)	(0.148)
Baseline score	0.710***	0.724***	0.566***	0.575***
	(0.039)	(0.045)	(0.054)	(0.052)
Constant	0.320	-0.999	-0.229	0.194
	(0.414)	(0.618)	(0.636)	(0.746)
F-stat of tests of significance				
Joint significance of RCs	1.858	0.413	8.156	0.500
	[0.145]	[0.798]	[0.000]	[0.736]
RC2=RC1	1.269	0.222	2.545	0.811
	[0.269]	[0.641]	[0.121]	[0.375]
RC3=RC2	3.510	1.184	9.319	0.833
	[0.071]	[0.286]	[0.005]	[0.369]
RC4=RC3	0.124	0.791	23.853	1.090
	[0.727]	[0.381]	[0.000]	[0.305]
Controls	Yes	Yes	Yes	Yes
Obs	1222	1399	1222	1399
R^2	0.498	0.363	0.338	0.258

Notes: This table shows results of estimating equation 1 where the dependant variable is the normalised combined student score. The sample is restricted to 2621 students present in all three rounds. We estimate this equation separately for private and public schools. For each type of school, we report the weighted estimates with baseline controls for each round. Student-level controls include student baseline score, a grade dummy and gender. We control for school characteristics such as pupil-teacher ratio , class size and number of school facilities. Village controls include male adult literacy and number of schools in the village. Panchayat variables include an index of school competition and development block dummy. In the lower panel, we report the F-stats of the tests of joint significance and incremental effects of treatment groups. Standard errors clustered at panchayat-level are in parenthesis. P-values of F-stats in brackets. Significance *** 1% **5% *10%.

Table 13: ROBUSTNESS CHECK: IMPACT OF REPORT CARDS ON TEST SCORES

Sample	**Student Panel**		**Pooled Sample**	
	Round 1	**Round 2**	**Round 1**	**Round 2**
	(1)	(2)	(3)	(4)
RC 1	0.006	0.069	-0.011	0.087
	(0.166)	(0.158)	(0.194)	(0.128)
RC 2	0.170	0.124	0.197	0.117
	(0.148)	(0.144)	(0.164)	(0.120)
RC 3	-0.068	-0.170	-0.046	-0.188
	(0.267)	(0.172)	(0.267)	(0.158)
RC 4	0.079	0.318**	0.091	0.254*
	(0.118)	(0.120)	(0.136)	(0.128)
Public*RC 1	-0.512**	-0.424	-0.607**	-0.563
	(0.223)	(0.287)	(0.277)	(0.346)
Public*RC 2	-0.298	-0.192	-0.377	-0.200
	(0.211)	(0.125)	(0.257)	(0.143)
Public*RC 3	-0.335	-0.108	-0.466	-0.074
	(0.379)	(0.211)	(0.395)	(0.216)
Public*RC 4	-0.274	-0.300**	-0.293	-0.197
	(0.351)	(0.141)	(0.382)	(0.192)
Public	-0.658***	-0.566***	-0.576***	-0.598***
	(0.157)	(0.111)	(0.207)	(0.135)
Constant	0.355***	0.332***	0.287**	0.292***
	(0.095)	(0.101)	(0.118)	(0.080)
Point estimates for Public schools				
RC 1	-0.506	-0.355	-0.618	-0.476
	[0.016]	[0.086]	[0.003]	[0.102]
RC 2	-0.128	-0.068	-0.179	-0.083
	[0.442]	[0.609]	[0.223]	[0.493]
RC 3	-0.403	-0.277	-0.512	-0.262
	[0.157]	[0.119]	[0.061]	[0.109]
RC 4	-0.195	0.018	-0.202	0.057
	[0.528]	[0.864]	[0.522]	[0.597]
Controls	No	No	No	No
Obs	3991	2983	4835	3939
R^2	0.188	0.148	0.184	0.149

Notes: In this table we show estimates of the treatment effects for private and public schools in the same regression equation. Adding student baseline scores makes both the dummy for public schools and the constant insignificant which is why we drop this from our equation. The treatment effects for private schools are given by the coefficients of the *RCs*. The coefficient of *Public*RC* shows if the treatment effect for public schools was different from private schools. The point estimates of the effect for public schools are shown in the bottom panel. Column 1 and 2 show the results restricting the sample to students present at baseline and rounds 1 and 2 respectively. These estimates are weighted estimates to correct for attrition between baseline and follow-ups. Columns 3 and 4 show the *unweighted* estimates for the pooled sample of students. Standard errors are clustered at the panchayat level. P-values of the public school point estimates are in brackets. Significance *** 1% **5% *10%.

Table 14: IMPACT ON TEST SCORES BY STUDENT RANK AT BASELINE

	Private			Public		
Percentile Rank	**25 - 75**	**< 25**	**> 75**	**25 - 75**	**< 25**	**> 75**
	(1)	(2)	(3)	(4)	(5)	(6)
RC 1	0.184*	0.053	0.055	-0.258	-0.263	-0.014
	(0.098)	(0.141)	(0.071)	(0.214)	(0.260)	(0.260)
RC 2	0.266*	0.045	0.101	0.036	-0.377	0.093
	(0.131)	(0.212)	(0.090)	(0.174)	(0.256)	(0.163)
RC 3	0.099	-0.354*	-0.041	-0.182	-0.292	-0.054
	(0.090)	(0.174)	(0.070)	(0.156)	(0.260)	(0.111)
RC 4	0.291***	0.202	0.095	0.143	-0.169	-0.045
	(0.099)	(0.159)	(0.075)	(0.122)	(0.246)	(0.119)
Baseline score	0.593***	0.627***	0.560***	0.449***	0.538***	0.489***
	(0.087)	(0.084)	(0.127)	(0.074)	(0.154)	(0.085)
Constant	-0.159	0.048	-0.011	-0.153	0.008	-0.041
	(0.119)	(0.121)	(0.169)	(0.095)	(0.239)	(0.118)
Joint significance of RCs	3.164	2.908	2.514	1.660	0.623	0.431
	[0.028]	[0.039]	[0.063]	[0.186]	[0.650]	[0.785]
RC2=RC1	0.498	0.002	0.369	1.481	0.221	0.165
	[0.486]	[0.968]	[0.548]	[0.233]	[0.641]	[0.687]
RC3=RC2	2.358	3.258	3.193	1.282	0.123	1.465
	[0.135]	[0.081]	[0.084]	[0.267]	[0.729]	[0.236]
RC4=RC3	6.041	11.189	8.691	4.612	0.284	0.031
	[0.020]	[0.002]	[0.006]	[0.040]	[0.598]	[0.860]
Controls	No	No	No	No	No	No
Obs	702	323	330	816	401	411
R^2	0.204	0.296	0.115	0.129	0.086	0.157

Note: This table shows results of estimating equation 1 where the dependant variable is the normalised combined student score in round 2. The sample is restricted to 2983 students present at baseline and round 2. For each school type, we report the results for three sub-samples of students- those between 25th and 75th percentile, those below 25th percentile and those above 75th percentile in their class at the baseline. These are unrestricted estimates with controls only for student's baseline score. In the lower panel, we report the F-stats of the tests of joint significance and incremental effects of treatment groups. Standard errors clustered at panchayat-level are in parenthesis. P-values of F-stats in brackets. Significance *** 1% **5% *10%.

Table 15: MARGINAL EFFECTS OF PROBABILITY OF BEING ABSENT IN ROUND 1

	All schools		**Tested in school**	
	Private	**Public**	**Private**	**Public**
	(1)	(2)	(3)	(4)
RC 1	-0.048***	0.016	-0.050***	-0.009
	(0.013)	(0.022)	(0.012)	(0.016)
RC 2	-0.055***	0.050**	-0.056***	0.019
	(0.011)	(0.023)	(0.012)	(0.018)
RC 3	-0.033**	0.031*	-0.034**	0.001
	(0.014)	(0.018)	(0.017)	(0.014)
RC 4	-0.041***	0.027	-0.040***	0.016
	(0.012)	(0.020)	(0.014)	(0.017)
Baseline score	0.008	-0.016***	0.010	-0.009
	(0.006)	(0.005)	(0.006)	(0.006)
Girl	-0.007	-0.023**	-0.006	-0.020**
	(0.010)	(0.010)	(0.010)	(0.010)
Class 5	-0.058	-0.005	-0.061	-0.014
	(0.048)	(0.031)	(0.048)	(0.035)
Pupil-Teacher ratio	-0.000	-0.001	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Class size	0.001	0.000	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
No. school facilities	-0.047	0.028	-0.048	0.060*
	(0.039)	(0.037)	(0.039)	(0.035)
Village male literacy	0.067	0.047	0.109	0.085
	(0.077)	(0.056)	(0.079)	(0.065)
No. school in village	0.009	0.005	0.008	0.005
	(0.007)	(0.006)	(0.008)	(0.006)
Panchayat HH index	-0.237**	0.142	-0.210*	0.160*
	(0.108)	(0.109)	(0.114)	(0.090)
PS dummy (d)	0.036	-0.005	0.039	0.009
	(0.049)	(0.021)	(0.048)	(0.022)
School did not participate	-0.027**	0.154**		
	(0.011)	(0.073)		
Class 5* School has grade 6+	0.078	0.029	0.080	0.034
	(0.063)	(0.033)	(0.064)	(0.039)
School has grade 6+	0.030**	0.039***	0.030*	0.038***
	(0.015)	(0.011)	(0.017)	(0.013)
Village has public secondary school	-0.027**	-0.036**		
	(0.013)	(0.015)		
Obs	2230	2909	2170	2745
Pseudo R^2	0.077	0.066	0.071	0.038

Notes: This table shows the marginal effects from the probit estimates of temporary attrition from the baseline sample of 5139 students from 158 schools. The dependant variable takes value 1 if a student drops out of the sample in round 1 but returns in round 2 and 0 otherwise. We report the results separately for private and public schools. Columns 1 and 2 show the results for all schools. In columns 3 and 4, we drop the 5 schools where we could not administer the test to the entire grade in round 1 and had to do so for a sub sample of students in their homes. Standards errors are clustered at the panchayat level. Significance level ***1% **5% *10%.

Table 16: IMPACT OF REPORT CARDS ON CHANGING SCHOOLS

Dependant variable	**Proportion of students changing schools in a grade**				
	All schools	**Private**	**Public**	**Private**	**Public**
	(1)	(2)	(3)	(4)	(5)
RC	0.062**	0.043	0.059**		
	(0.027)	(0.037)	(0.026)		
RC1-3				0.065	0.041
				(0.038)	(0.030)
RC4				-0.005	0.088***
				(0.053)	(0.030)
Constant	-0.030	0.157	0.155	-0.081	-0.121
	(0.094)	(0.298)	(0.287)	(0.104)	(0.098)
Controls	Yes	Yes	Yes	Yes	Yes
Obs	273	118	155	118	155
R^2	0.154	0.192	0.134	0.207	0.148

Notes: This table shows the impact of report cards on changing schools in the new academic year. We use the household sample of 1485 students for this analysis collapsed at the school-grade level but exclude grade 5 of primary only schools. The dependant variable is the percentage of students who switched to new schools. The coefficient of interest in columns 1 to 3 is that on RC which shows the impact of receiving any report card. In columns 4 and 5, we show the effects of receiving different types of parental report cards. Here, we club RC1 to RC3 together as the parental report card remains the same in these treatments. We control for school characteristics such as pupil-teacher ratio , class size and number of school facilities. Village controls include male adult literacy and number of schools in the village. Panchayat variables include an index of school competition and development block dummy. Standard errors clustered at panchayat-level in parenthesis. Significance *** 1% **5% *10%.

Table 17: GAIN IN SCHOOL RANK DUE TO REPORT CARDS

	All schools	**Private**	**Public**
	(1)	(2)	(3)
RC1-3	-0.050	-0.033	-0.067
	(0.039)	(0.062)	(0.068)
RC4	0.126*	0.187***	0.076
	(0.066)	(0.053)	(0.126)
Baseline score	-0.060**	0.011	-0.094***
	(0.028)	(0.057)	(0.028)
Constant	-0.221	-0.503	0.172
	(0.249)	(0.364)	(0.317)
Controls	Yes	Yes	Yes
Obs	1363	565	798
R^2	0.042	0.044	0.053

Notes: This table shows the impact of report cards on school choice. The dependant variable is the change in rank of schools chosen by students between baseline and round 2. This defined as the negative of the difference between the baseline rank of a student's school and that chosen in round 2. Therefore, this is 0 if a student does not change schools, positive if the students switches to a higher ranked schools and negative if she chooses a low ranked schools. This analysis is done at the student level excluding students who moved to schools outside the study area and for which we did not have ranks. This, therefore, reduces the sample to 1363 of 1485 students. Student-level controls include student baseline score, a grade dummy and gender. We control for school characteristics such as pupil-teacher ratio , class size and number of school facilities out of 8. Village controls include male adult literacy and number of schools in the village. Panchayat variables include an index of school competition and development block dummy. Standard errors clustered at panchayat-level in parenthesis. Significance *** 1% **5% *10%.

Appendix

Table A1: BALANCE OF PANCHAYAT AND VILLAGE CHARACTERISTICS AT BASELINE

		Difference of Treatments from Control			
	Control Mean	**T1- Control**	**T2- Control**	**T3- Control**	**T4- Control**
	(1)	(2)	(3)	(4)	(5)
Panchayat Variables					
Pvt school combined raw score	226.40	-11.87	-12.13	-12.31	3.22
	(12.020)	(16.380)	(17.000)	(17.830)	(17.000)
Pub school combined raw score	145.10	-18.21	-3.23	-20.38	-5.41
	(9.685)	(13.700)	(14.260)	(16.060)	(14.260)
Pvt school combined z- score	0.71	-0.14	-0.15	-0.15	0.04
	(0.151)	(0.206)	(0.213)	(0.224)	(0.213)
Pub school combined z- score	-0.31	-0.23	-0.03	-0.26	-0.05
	(0.124)	(0.176)	(0.183)	(0.206)	(0.183)
Index of School Competition	0.27	0.04	-0.05	0.06	-0.02
	(0.030)	(0.042)	(0.044)	(0.044)	(0.044)
Number of Villages per panchayat	2.28	-0.14	0.55	-0.12	0.55
	(0.429)	(0.607)	(0.631)	(0.631)	(0.631)
Village Variables					
Number of Schools in Village	2.19	0.04	0.13	0.20	-0.19
	(0.449)	(0.555)	(0.602)	(0.626)	(0.519)
Number of Pvt Schools in Village	1.06	-0.06	-0.31	-0.14	-0.33
	(0.350)	(0.433)	(0.398)	(0.435)	(0.419)
Average distance from nearest town	12.19	1.20	4.31	2.51	3.15
	(1.897)	(3.994)	(3.615)	(4.349)	(2.343)
Village has a public secondary school	0.31	0.00	-0.06	0.00	-0.11
	(0.063)	(0.136)	(0.091)	(0.095)	(0.097)
% SC persons	0.003	0.017	-0.00	0.00	-0.00
	(0.002)	(0.018)	(0.002)	(0.003)	(0.001)
Male adult literacy	0.72	-0.072*	0.043	0.012	-0.06
	(0.20)	(0.037)	(0.048)	(0.044)	(0.033)
% of health facilities	0.34	0.11	0.03	0.05	-0.07
	(0.050)	(0.065)	(0.052)	(0.068)	(0.057)

Notes: This table shows the balance of baseline characteristics of 32 village councils and 73 villages. Column 1 shows the means for the control group while columns 2 to 5 show the difference of the treatments from the control. Please refer to table 3 for explanation of variables. Standard errors clustered at panchayat-level in parenthesis. Significance *** 1% **5% *10%

Table A2: BALANCE OF SCHOOL CHARACTERISTICS AT BASELINE

		Difference of Treatments from Control			
	Control Mean	**T1- Control**	**T2- Control**	**T3- Control**	**T4- Control**
	(1)	(2)	(3)	(4)	(5)
Pvt school combined raw score	225.70	-12.29	-17.72	-11.49	1.15
	(7.384)	(11.220)	(11.480)	(11.480)	(11.780)
Pub school combined raw score	140.70	-10.79	1.83	-15.40	2.56
	(9.877)	(14.400)	(12.950)	(14.400)	(13.780)
Pvt school combined z score	0.71	-0.16	-0.21	-0.15	0.02
	(0.094)	(0.143)	(0.146)	(0.146)	(0.150)
Pub school combined z score	-0.37	-0.13	0.03	-0.18	0.05
	(0.127)	(0.184)	(0.166)	(0.184)	(0.177)
Rank of pvt school in village	1.65	-0.19	-0.31	-0.31	-0.10
	(0.175)	(0.266)	(0.272)	(0.272)	(0.279)
Rank of pub school in village	2.44	-0.13	-0.04	0.37	-0.39
	(0.325)	(0.474)	(0.426)	(0.474)	(0.454)
Class size	15.79	-0.13	3.49	0.83	1.68
	(1.664)	(2.472)	(2.322)	(2.496)	(2.450)
Total Enrolment in School	204.60	-20.16	-2.14	-4.30	2.30
	(20.900)	(31.360)	(29.160)	(31.680)	(31.360)
Pupil-Teacher Ratio	28.24	1.84	6.48**	3.74	3.98
	(2.043)	(3.065)	(2.850)	(3.096)	(3.065)
Annual Fees in Private Schools	1453.10	-268.20	178.80	-312.30	397.90
	(267.500)	(408.600)	(419.100)	(408.600)	(431.300)
% of School Facilities	0.73	-0.02	-0.01	-0.04	0.00
	(0.026)	(0.038)	(0.036)	(0.039)	(0.038)

Notes: This table shows the balance of baseline characteristics of 159 schools. Column 1 shows the means for the control group while columns 2 to 5 show the difference of the treatments from the control. Please refer to table 4 for explanation of variables. Standard errors clustered at panchayat-level in parenthesis. Significance *** 1% **5% *10%

Table A3: BALANCE OF INDIVIDUAL CHARACTERISTICS AT BASELINE

		Difference of Treatments from Control			
	Control Mean	**T1- Control**	**T2- Control**	**T3- Control**	**T4- Control**
	(1)	(2)	(3)	(4)	(5)
% in pub schools	0.49	0.089	0.141	0.037	0.093
	(0.059)	(0.085)	(0.096)	(0.131)	(0.071)
Girls	0.46	-0.102**	-0.06	-0.05	0.00
	(0.024)	(0.036)	(0.034)	(0.043)	(0.035)
Grade 5	0.48	0.03	0.01	0.02	0.01
	(0.018)	(0.026)	(0.032)	(0.023)	(0.036)
From household survey					
Education of Household Head					
(i) Illiterate	0.31	0.02	0.02	0.03	-0.01
	(0.049)	(0.064)	(0.062)	(0.070)	(0.074)
(ii) Grade 1-5	0.16	0.02	-0.02	-0.04	-0.03
	(0.016)	(0.025)	(0.030)	(0.036)	(0.025)
(iii) Grade 6-10	0.48	-0.02	0.01	0.02	0.02
	(0.033)	(0.052)	(0.047)	(0.065)	(0.063)
(iv) Grade 11-College	0.06	-0.02	-0.02	-0.01	0.02
	(0.020)	(0.022)	(0.028)	(0.027)	(0.027)
% of Household Assets	0.67	-0.02	-0.04	-0.03	-0.04
	(0.021)	(0.027)	(0.024)	(0.027)	(0.040)

Notes: Student characteristics such as gender, grade are reported for 5155 baseline students. The sub-panel below this reports student variables from the household sub-sample of 1499 students. Column 1 shows the means for the control group while columns 2 to 5 show the difference of the treatments from the control. Please refer to table 4 for explanation of variables. Standard errors clustered at panchayat-level in parenthesis. Significance *** 1% **5% *10%

Table A4: CORRELATION OF AUXILIARY ATTRITION VARIABLES TO BASELINE CHARACTERISTICS

	Non-participant school in any round		**School has grade over 5**	
	Private	**Public**	**Private**	**Public**
	(1)	(2)	(3)	(4)
RC1	-0.055	-0.030	0.014	-0.028
	[0.700]	[0.822]	[0.931]	[0.842]
RC2	-0.076	0.030	0.110	-0.149
	[0.595]	[0.803]	[0.495]	[0.235]
RC3	-0.141	-0.053	0.205	-0.104
	[0.289]	[0.703]	[0.174]	[0.467]
RC4	-0.163	-0.091	0.265	0.042
	[0.229]	[0.473]	[0.086]	[0.749]
School baseline score	-0.465	0.012	-0.181	-0.433*
	[0.086]	[0.946]	[0.550]	[0.020]
Pupil Teacher Ratio	0.001	0.006	0.007	-0.015***
	[0.772]	[0.077]	[0.162]	[0.000]
Class size	-0.003	-0.007	0.002	0.027***
	[0.528]	[0.121]	[0.684]	[0.000]
No. of school facilities	0.276	0.251	0.545	0.272
	[0.434]	[0.376]	[0.175]	[0.352]
Village male literacy	0.166	-0.484	-0.749	0.530
	[0.787]	[0.223]	[0.285]	[0.196]
No. of schools in village	-0.061	0.004	-0.011	-0.056
	[0.106]	[0.914]	[0.794]	[0.103]
Constant	0.342	0.254	0.466	0.270
	[0.529]	[0.486]	[0.449]	[0.472]
Observations	65	94	65	94
R^2	0.147	0.096	0.163	0.435

Notes: This table shows the correlation between the auxiliary attrition variables and school characteristics. P-values are reported below each coefficient.

Figure 1: TEHSIL MAP OF AJMER DISTRICT SHOWING STUDY AREA

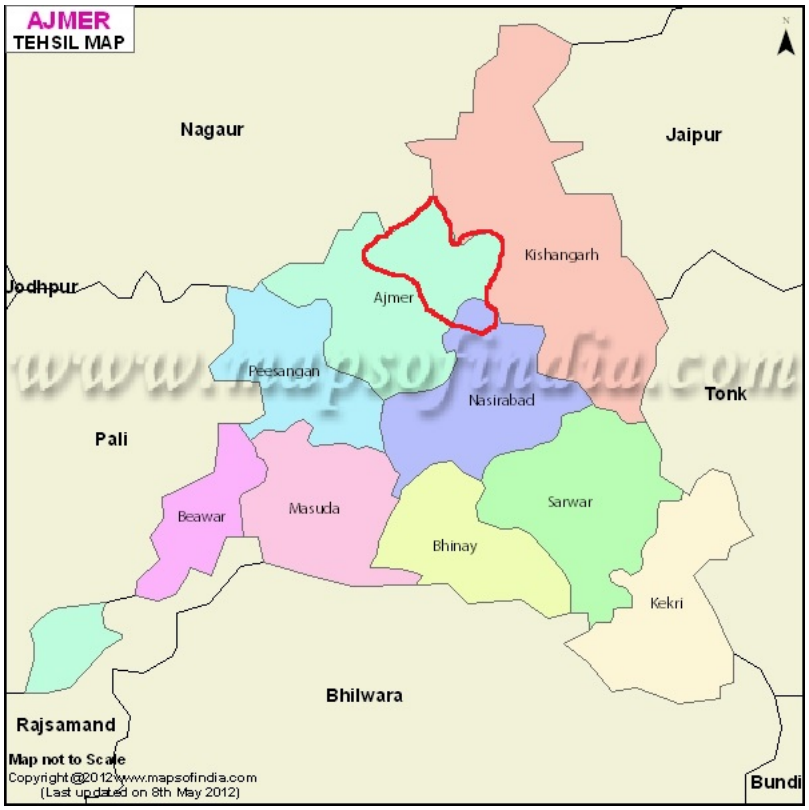
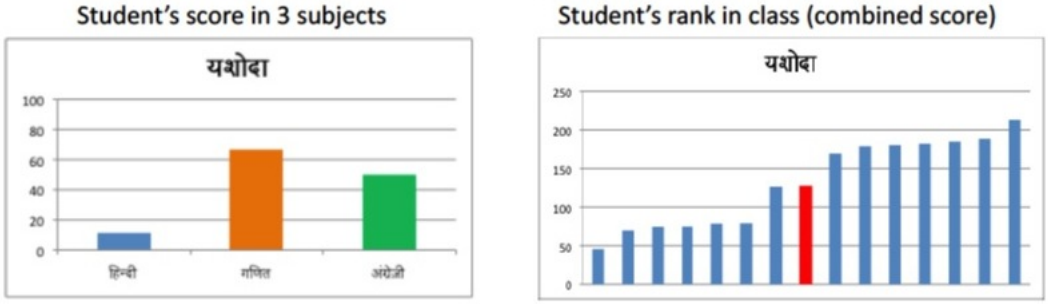
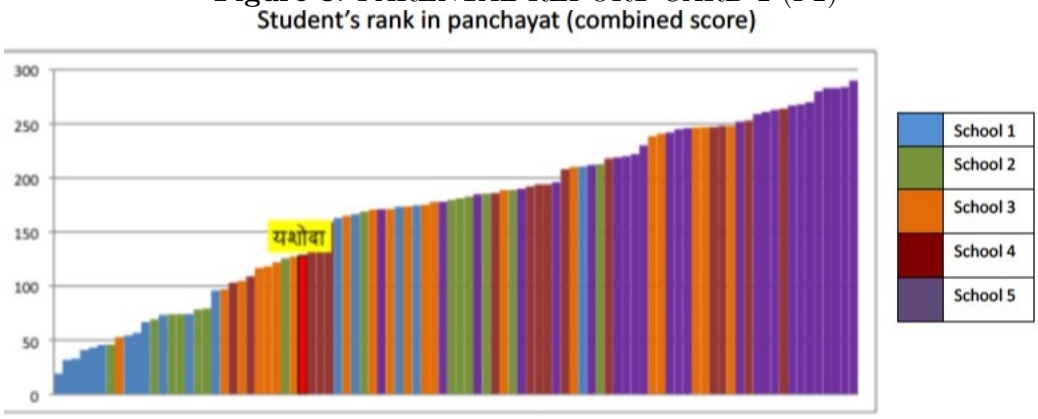


Figure 2: PARENTAL REPORT CARD 1 (P1)



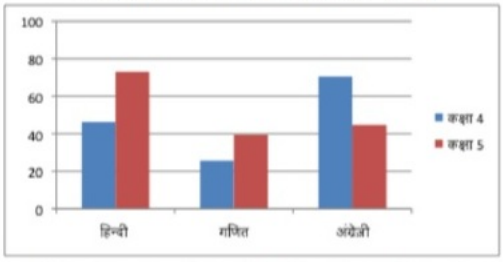
Notes: The graph to the left shows a student's score out of 100 in each subject. The blue bar shows her score in Hindi, the orange bar for Math and the green bar for English. The graph on the right shows the combined scores (out of 300) of all students in her class with the student's score highlighted by the red bar.

Figure 3: PARENTAL REPORT CARD 2 (P2)



Notes: This graph shows the combined scores (out of 300) of all students of the same grade in the panchayat. Each bar shows the score of one student. Students of the same schools are depicted by bars of the same colour. The target student is highlighted in red.

Figure 4: SCHOOL REPORT CARD 1 (S1)



Number of student achieving proficiency

हिन्दी	कक्षा 4	कक्षा 5	गणित	कक्षा 4	कक्षा 5	अन्ग्रेजी	कक्षा 4	कक्षा 5
वर्णमाला लिखना और शब्दों का पेहचान	10	20	गिनती			वर्णमाला लिखना और शब्दों का पेहचान		
शब्द और वाक्य लिखना	8	7	जोड़ i) 1-अंक ii) 2- अंक iii) 3- अंक			शब्द लिखना		
सरल कहानी समझना	10	4	घटाव i) 1-अंक ii) 2- अंक iii) 3- अंक			सरल कहानी समझना		
कठिन कहानी समझना	9	4	गुणा i) 2-अंक X 1-अंक ii) 2- अंक X2- अंक					
अनुच्छेद लिखना	7	6	मापना- तौलना					
			ज्यामिती					
Total	10	28	वाक्य पढकर हल करना					

Notes: The graph on top shows the average scores in each subject of grade 4 (in blue) and grade 5 (in red) of a school. The table below reports the number of students who have achieved a particular competency such as reading a sentence etc. for each grade.

Figure 5: SCHOOL REPORT CARD 2 (S2)

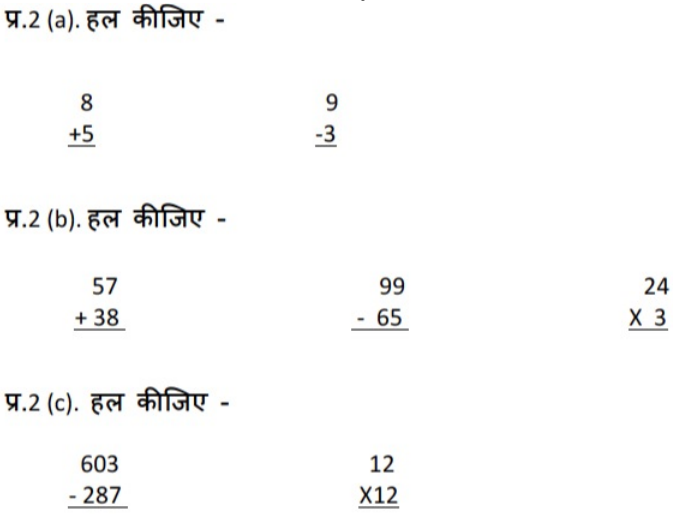
Average School Score in Three Subjects (Max=100)

Class 4	School Name		Hindi	Math	English
1	RAJKIYA MADHYAMIK VIDHALYA,SAIDARIYA	Saidriya	26	24	18
2	RAJKIYA PRATHMIK VIDHALYA,RAIL KI BAADIYA	Saidriya	45	50	57
3	RAJKIYA UCCH PRATHMIK VIDHALYA,BARGAON	Badgaon	38	35	29
5	SATYANAND PUBLIC SCHOOL,BADGAV	Badgaon	77	81	85
6	SRI NAMDEV VIDYA MANDIR, BADGAON	Badgaon	68	61	74

Class 5	School Name		Hindi	Math	English
1	RAJKIYA MADHYAMIK VIDHALYA,SAIDARIYA	Saidriya	27	34	28
2	RAJKIYA PRATHMIK VIDHALYA,RAIL KI BAADIYA	Saidriya	69	70	78
3	RAJKIYA UCCH PRATHMIK VIDHALYA,BARGAON	Badgaon	54	55	63
5	SATYANAND PUBLIC SCHOOL,BADGAV	Badgaon	85	92	87
6	SRI NAMDEV VIDYA MANDIR BADGAO	Badgaon	73	73	75

Notes: This table reports the average score in each subject of all schools in panchayat.

Figure 6: EXAMPLES OF MATH QUESTIONS BY DIFFICULTY LEVEL



Notes: These are examples of math questions by difficulty level. Students should be able to solve question 2(a) if they have completed grade 1, 2(b) if grade 2 and 2(c) if grade 3.

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