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Parent–teacher meetings and student outcomes: Evidencefrom a developing country☆

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ABSTRACT

We conduct a randomized field experiment involving regularly scheduled face-to-face meetings between teachers and parents over a period of two academic years. At each of these meetings, the teacher provided the parents with a report card and discussed the child's academic progress. We find that the overall test scores of the students in the treatment schools compared to control schools increased by 0.26 SD in the first year, and 0.38 SD by the end of the second year. The program also resulted in improvements in both student attitudes and behavior, and teachers' pedagogical practices. The intervention encouraged parents to spend more time assisting their children and monitoring their school work. The treatment effects are robust across parental, teacher, and school-level characteristics, and the findings indicate that programs for stimulating parent–teacher interactions are cost-effective, easy to implement, and easy to scale up.

1. Introduction

Parents can potentially play an important role in their children's overall learning and education, both at home and at school. Policy makers and educational experts have often advocated parents being encouraged to be more involved in their children's academic lives.[1] Many children in developing countries are first-generation students, and the parents of such children are often unable to follow what happens at school (Banerjee and Duflo, 2006). Many of these parents are not motivated to send their children to school or to encourage them to study.

This paper reports the results of a randomized field experiment involving a low-cost intervention that examined whether students' educational achievements can be improved by increasing parental engagement through scheduled parent–teacher

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[1] In his 2009 address to the joint session of Congress, President Obama stated that "There is no program or policy that can substitute for a mother or father who will attend those parent–teacher conferences or help with the homework or turn off the TV, put away the video games, read to their child. Responsibility for our children's education must begin at home."

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meetings. The experiment involves monthly meetings that are similar to the parent–teacher interviews that occur in schools in many developed countries. At each meeting, the teacher provided a report card that contained information about a child's academic performance.

Parental involvement with their children's education can occur either at home (e.g., homework) or at school (e.g., meetings, support, and/or volunteering). The interactions with teachers, such as having parent–teacher meetings in schools, may improve accountability and transparency, resulting in an improvement in school services (e.g., Kremer et al., 2013; Mbiti, 2016). Teacher accountability is likely to be improved by providing regular reports to parents, which might change their pedagogical practices or efforts. Similarly, parents might be more engaged with children at home if they met the teachers regularly to discuss their children's performances, homework, etc.[2] We examined these channels by conducting separate surveys for parents, teachers, and students. We also examined changes in both the students' behaviors and the teachers' perceptions of the students and their behaviors.

Our main results can be summarized as follows. First, parent–teacher meetings have a significant positive impact on children's school results. Students who were in the program for two successive years had increased their overall test scores by 0.26 standard deviations (SD) at the end of year 1, and by 0.38 SD at the end of year 2. They had also improved their reading and writing abilities, as well as their general knowledge. Second, the short-term treatment effects are the greatest for high ability students, whereas low ability students gain greater benefits from more frequent parent–teacher interactions over time. Third, the treated students showed more positive attitudes and higher aspirations, spent more time studying, and got more help from with studying family members. Their behavior, as reported by both teachers and parents, also improved. Thus, we observed increased parental involvement in their children's studies. Fourth, we saw improvements in absenteeism among both teachers and students. More importantly, we observed changes in the teachers' efforts in terms of pedagogical practices. Overall, our results suggest that the interventions operated through both parents and teachers. We also found some positive spillover effects on students in other grades of the treatment schools. Our results demonstrate that an increased parental involvement in their children's education through scheduled parent–teacher meetings can be a cost-effective tool for enhancing student achievement.

A number of recent studies in the US have demonstrated that an increase in parental involvement in their children's learning is generally associated with better grades, test scores, and attendance, as well as with increased motivation and an easier transition to higher grades (see for example Bergman, 2016; and Hastings and Weinstein, 2008)[3]. However, none of these studies examine the effectiveness of parent-teacher meetings. Nevertheless these studies offer evidence that providing information to parents can help the children learning at home.

In contrast to developed countries, the educational reality in developing countries is fundamentally different. Many children in developing countries are first-generation students and their parents do not know how to help their children. Schooling has long-term benefits for children but short-term costs for parents. Many of these parents often keep their children out of school to supplement household earnings or to do household work. They are not motivated to send their children to school or encourage them to study. In rural settings in Bangladesh, parents have limited contact with teachers, and have very little knowledge about what is happening in their child's school.[4] We focus on low-income parents in rural communities who are under-represented in society, and tend to be less involved in their children's educations. The main objective of the meetings was to ensure formal communications between parents and teachers so as to provide them with the opportunity to meet and discuss the students' academic progress.

Although running regularly scheduled parent–teacher meetings is a conventional practice in most developed countries, the present study is the first to examine the effectiveness of encouraging active parental involvement through one-on-one parent–teacher meetings in a developing country. The study most similar to the present one was that undertaken in France by Avvisati et al. (2014), who conducted a field experiment in a relatively deprived educational district of Paris which involved holding *three* general *group* meetings between parents and teachers over an academic year so as to encourage parents to be more involved in their children's education. Avvisati et al. (2014) did not find any improvements in the test scores of the treated students, except in French. However, they did find a 25% decline in truancy among low-income families and an improvement in behavior among all students in the selected classes, including those whose parents did not participate.

[2] Parental *efforts* can also be crowded out by school resources, as parents may view their efforts and school quality as substitutes (Houtenville and Conway, 2008; Pop-Eleches and Urquiola, 2013). For example, Das et al. (2013) observed household substitution in *spending* in response to anticipated education grants in primary schools in India and Zambia, while Barrera-Osorio et al. (2011) found similar results in Colombia in response to a conditional cash transfer program. They found that parents took resources away from untreated siblings. On the other hand, Gelber and Isen (2013) observed a substantial increase in parental involvement in response to a government-funded preschool program.

[3] For example, Bergman (2016) finds that sending text messages to parents when their children had missed assignments improved students' performances in a low-income area of Los Angeles. In a study of schooling in North Carolina, Hastings and Weinstein (2008) found that informing parents of different public schools' average test scores led parents to choose higher-performing schools for their children.

[4] There are numerous reasons for the low level of parental involvement with school in rural and disadvantaged societies, such as men's physical labor, women's household chores and child-rearing duties, social norms, shyness (especially due to their lack of education), insufficient understanding of or information about the structure of the school system and the accepted communication channels, and a perception that teachers do not welcome such involvement. There is also a perception among teachers that parents are not interested in, or do not have the ability to help with, their children's schooling. Informal communication is rare too, being limited to parents who are themselves very much motivated. The sorts of informal talks that usually occur at pick-up and/or drop-off times in schools in developed countries do not tend to happen in rural primary schools in developing countries because parents do not pick up or drop off their children; instead, students usually go to nearby schools by themselves.

We differ from Avvisati et al. (2014) in that we consider one-on-one meetings between parents and teachers, which allowed frequent individualized communication. Our chosen method—regular (monthly) face-to-face meetings between parents and teachers—is highly appropriate for the conditions of developing countries because it is a low-cost, easy-to-implement method that does not rely on written communication (which is important in situations where many parents have poor literacy). We organized *thirteen* face-to-face meetings over the two academic years 2011–2012. Like Avvisati et al. (2014), we implemented the intervention in poor areas, but we chose remote *rural* communities. The intervention was not intended to help any particular group, given that most of the children, whether high- or low-performing, were from disadvantaged backgrounds, and it was impossible to know who may have had the most to gain from such an intervention. The parents of these children have low incomes, are under-represented in society, and tend to be less involved in their children's educations.

There are a few studies in developing countries that have sought to provide parents with information.[5] For example, in Pakistan, Andrabi et al. (2017) used report cards to provide information to both parents and schools about students' tests scores. Nguyen (2008) provided parents with information about returns to school in Madagascar. Dizon-Ross (2017) conducted information intervention and provided report cards to parents through *surveyors* in Malawi. As in the case of the current study, the report cards contained information about the children's academic performances at school; however, there was no direct engagement between teachers and parents. These interventions have all led to significant increases in student enrollments, attendance and test scores, as well as in parental investment in education. The results of these studies suggest that parents lack knowledge, but still have the ability to process new information and change their decisions in a sophisticated manner.[6]

On the other hand, studying India and Kenya respectively, Banerjee et al. (2010) and Lieberman et al. (2014) found the effects of parents receiving information on students' learning outcomes to be negligible. Their findings indicate that the mere provision of information may not be sufficient to improve students' performances if the parents have limited abilities to either help them at home or influence the quality of their school education. However, once the provision of information is bundled with a teaching intervention, Banerjee et al. (2010) found increases in test scores in a program that used community volunteers as instructors, which suggests that involving teachers may be another important element in impacting learning.

2. Study context and background

We implemented the intervention in the rural areas of two southern districts (Khulna and Satkhira) of Bangladesh. Most of the children are underprivileged and have parents from relatively low socioeconomic backgrounds. In our study area, approximately a quarter of the parents did not complete primary school, and more than 80% of families have no members who have been educated past grade 10. Most mothers (80%) have had fewer than eight years of education, and 98% work only in the home. Most fathers (90%) are engaged in agriculture, self-employment activities, or day labor. The average household size in our sample is five, and the average household monthly income is less than $150.

The school curriculum is the same in both the rural and urban areas of Bangladesh.[7] Primary schooling (grades 1–5) is compulsory, and incentives are offered to get children to come to school; in particular, rural girls receive cash grants for attending school (Hahn et al., 2018). In 2015, the net enrollment rate in primary schools was 98% for girls and 97% for boys, while the rate in secondary schools was 54% for girls and 45% for boys. Between 1990 and 2013, the gender parity index (the school enrollment ratio of girls to boys) increased from 0.83 to 1.06 in primary schools and from 0.51 to 1.08 in secondary schools. At the primary school level, the teacher–student ratio is about 1:50 (BANBEIS, 2013).

Since the early 1990s, numerous policies, including the compulsory primary education law in 1991, have been enacted to ensure that all students attend, and complete, a primary education. The government launched the Food for Education program in 1993 to support poor children in completing primary schooling, and in 2002 this was replaced by the Primary Education Stipend Project (PESP), which provides cash transfers to households with children attending schools in poor areas. In addition, a variety of policies, including the elimination of official school fees and the provision of free textbooks, have also been put in place to encourage school enrollment (Hahn et al., 2018).

A single curriculum serves all students across the country. Education is exam-driven, because the success of both teachers and schools is measured by their students' results on exams, which primarily demand the memorization and recall of content from textbooks (Holbrook, 2005). As a consequence, teachers often encourage their students to perform rote learning and focus largely on preparing students for their exams (Tapan, 2010). Students are generally promoted to the next grade at the end of the academic year after passing the final exam. The exception is at the end of grade 5, when students

[5] A few recent studies have focused directly on the demand for schooling, such as training mothers to enhance their children's learning (Banerji et al., 2017) and purchasing bicycles for girls to allow them to attend school (Muralidharan and Prakash, 2017). On the other hand, there have also been various interventions such as the traditional remedial educational interventions to improve the quality on the supply side through the provision of textbooks (Glewwe et al., 2009), flipcharts (Glewwe et al., 2004), school meals (Afridi, 2010), additional teachers (Duflo et al., 2011; Muralidharan and Sundararaman, 2013), and classroom computers (Banerjee et al., 2007). These programs have generally been found to have positive effects on both attendance and test scores; however, most are expensive to implement (see Section 5.7 on the cost-effectiveness of our program). See Glewwe and Muralidharan (2016) for a review of the literature.

[6] In a related study, in Brazil, Bursztyn and Coffman (2012) found that sending text messages to poor parents when their children had skipped school increased school attendance of the children.

[7] Some specialized and private schools in urban areas also offer additional extracurricular activities.

must face their first public examination, called the primary school certificate (PSC) exam. The results of the PSC exam are used to determine students' progression to secondary school.

However, education quality remains a major concern: nearly 50% of Bangladeshi students drop out of primary school before completing grade 5, and only around 2% of children achieve the prescribed competencies by the end of grade 5 (BANBEIS, 2013). Approximately 70% of children who complete primary school nationwide are unable to read, write, or count properly. Various factors contribute to this trend, including absenteeism by both teachers and students, low classroom teaching time, and inflexibility in school hours. Studies have found that teacher absenteeism hovers around 25%, with many teachers not instructing students even when present at school. In addition, student absenteeism ranges from 40% to 67%, and the daily effective instruction time in Bangladeshi primary schools is only 2.5 hours (UNESCO, 2010). Although recent government initiatives have increased female enrollments, the academic performances of girls are still significantly lower than those of boys (Hahn et al., 2016).

2.1. Intervention and evaluation design

2.1.1. The intervention

The experiment involved scheduled parent–teacher meetings that were similar to the parent–teacher conferences conducted in schools in many developed countries.[8] The meetings were conducted monthly over a period of two academic years, with the head teachers inviting the students' parents to these regular meetings to keep them informed about their children's progress in school. The teachers also provided the parents with written feedback by preparing a report card for each student. In the particular context of Bangladesh, the parents felt the meetings to be more important and significant if a document such as a report card was shown to them at the meeting. The main purposes of the report card were to keep the information on each child separately, and to encourage parents of the treatment schools to pay attention to the information provided at the meetings.[9] The report card contained information about the student's test scores and the number of days the child had been absent from school in the preceding month. See Appendix C for a sample report card. The parents did not take the report card back home after the meeting, it was kept by the school.

The meetings were conducted by the class teachers. Each meeting between a parent and a teacher was one-on-one and lasted about 15 min. Children did not attend the meetings. At each meeting, the teacher explained how the child had performed on their regular class tests or semester exams. They also provided oral guidelines for the parent, including how they could help the child do their homework, how to check homework and class tests, the importance of timely attendance at school, how to prepare students to go to school, and more. Report cards were prepared separately for each child, with the guidelines being personalized rather than scripted, and depending on the specific circumstances of each student (and the parents) as perceived by class teachers. For example, if a child was not completing their homework, the teachers would advise the child's mother (or guardian) how she could help with completing the homework, or how to get assistance if no one in the family was able to help. In some cases, teachers offered extra help outside school hours if the parents were unable to help their children, but the teachers never encouraged or advised parents to go for additional tutoring.[10]

As the parents come from a range of different socio-economic and educational backgrounds, the teachers sometimes had to convey the same information to different parents in diverse ways. In providing a parent with overall guidelines, the teachers focused mainly on the student's academic growth, but also took into account the student's efforts in class, as well as their attitudes and behaviors. They were encouraged to discuss any issues (e.g., behavioral issues) related to students with their parents.

Note that report cards were prepared by teachers in both the treatment *and* control schools. There was *no* additional assessment for students in the treatment schools, as the report cards contained the *same* information in both the treatment and control schools. However, the parents in the control schools did not receive the report cards at any point during the intervention. The report cards in the control schools were prepared for the purposes of evaluation only, and no parent–teacher meetings were organized by the teachers at the control schools.[11] The report cards were made available to parents only during the meetings in the treatment schools.

The intervention was implemented by a local NGO (Global Development Research Initiative [GDRI]), with approval from the Bangladesh Department of Primary Education. Before the intervention began, the researcher and representatives of the GDRI program held separate meetings with the teachers in the treatment schools to inform them of the purpose of conducting the meetings, show them how to prepare the report cards, and give them instructions on providing parents with feedback about students.

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[8] For example, Australian schools have at least one parent–teacher interview session per academic term (there are four terms in a year), and there are also other formal and informal gatherings where parents and teachers can meet and share information about the children's progress in school.

[9] The schools do not keep any systematic student academic record, but only a student's semester exam results (there are two such exams in a year) and class attendance. They keep no record of a student's performance in the classroom, nor do they hold meetings with parents to provide any of this information.

[10] This sometimes entailed working with a better performing classmate or talking to a guardian who could help.

[11] Schools in Bangladesh, especially rural public schools, do not generally prepare report cards for students, as schools have no practice of issuing any regular information to parents. According to government guidelines for schools, parent–teacher meetings are supposed to be held a few times a year (though not monthly as we did), which also was confirmed by discussions with educational administrators in Bangladesh. In practice, though, they do not generally take place. However, such meetings are common in private schools in Bangladesh, as well as in select public schools in urban areas.

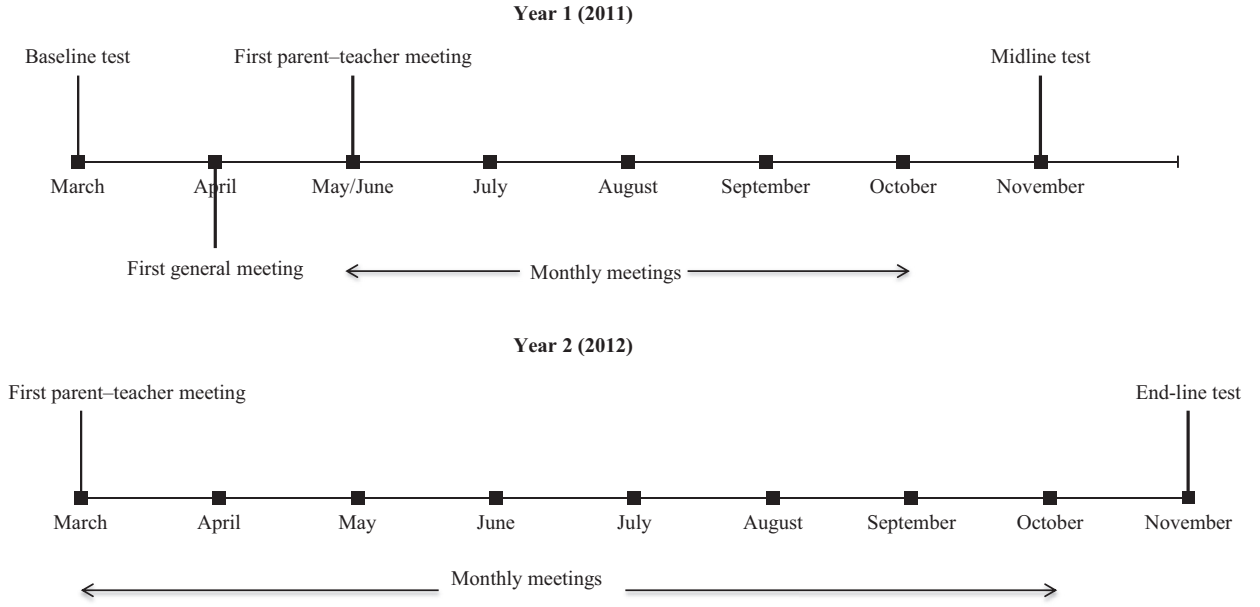


Fig. 1. Timeline of the project.

Both the treatment and control schools received official letters from the ministry (department) of primary education of Bangladesh, instructing them to help in conducting the research. Local district and sub-district educational administrators also directed the schools to support the activities of the project. A separate letter explaining the basic objectives of the monthly parent–teacher meetings was sent to the head teachers at the treatment schools, while the control schools received only a letter instructing them to support the project's activities. Neither the treatment nor control school teachers received any instruction to change their pedagogical practices or attitudes toward students.

Because the intervention required the school teachers to do additional work (discussing the students' progress with the parents and conducting additional class tests for the report card), all teachers in both the treatment and control schools were given a lump sum honorarium of US $25 for each of the two years (the average monthly salary of a primary school teacher is $120–$160, depending on their years of service).[12] Each school typically had four or five teachers.

2.1.2. The experimental design

The field experiment was carried out in 76 government primary schools in rural areas in two districts of Bangladesh. These schools were chosen randomly from a set of more than 200 schools in those regions, and are fairly typical of many parts of rural Bangladesh. The author spent his childhood and attended both primary and secondary school in that area, and the area was chosen because of the author's local knowledge and contacts at schools, the NGO, and the district level administration that facilitated the logistics for implementing the intervention.

A total of 40 schools were selected randomly for the treatment after baseline tests had been conducted. The remaining 36 schools served as the control group throughout the two years of intervention. The parent–teacher meetings began in the 2011 academic year; see Fig. 1 for the project timeline. The schools invited all parents to a short information session in early April 2011, at which the teachers explained the objectives of the monthly meetings. The schools then set a date each month for the meetings, usually one week in advance, and the teachers sent out verbal reminders or letters to the parents via the students before each meeting. After the initial meeting in April, the first meetings were held in May and June 2011. Field investigators were also present on the days when the parents and teachers met at the schools.

The meetings took place over two successive years, 2011 (Year 1) and 2012 (Year 2). In year 1, the experiments were conducted among students in grades 4 and 5, with a total of 4062 students being involved. Five meetings were held between May/June and October in year 1.[13] The meetings continued in year 2, but with the inclusion of the students in grade 3 (who

[12] While the teachers in the control schools did not organize any meetings with parents, they still had to prepare the report cards and conduct the tests. Thus, the teachers in the control schools were paid the same amount in order to avoid any conflict or discontent among teachers. For the same reason, we also paid all teachers in a given school, not only those teaching the classes directly involved. All of the teachers in the schools (not only the specific class teachers) were involved in conducting meetings and administering tests for the purpose of the study. The teachers were assisted by program staff members, but still had to do a small amount of paperwork which the program staff members could not do or were not authorized to do in the schools. Giving the same amount to teachers in the control schools also helps to avoid any other incentivizing effect on teachers besides conducting parent meetings (teachers who receive more money may put more effort into their teaching).

[13] In Bangladesh, the academic year starts in January. The final exam period, followed by the winter break, usually runs from mid-November to the end of December. Sports and other activities dominate January and February.

Table 1
Parent–teacher meetings by year and grade.

	Program in Year 1 (in 2011)	Program in Year 2 (in 2012)	Follow-up (in 2014)
Grade 3 (Year 2)		√	√
Grade 4 (Year 1)	√	√	√
Grade 5 (Year 1)	√		√

Notes: The cohort that was in grade 4 in 2011 (year 1) was in grade 5 in 2012 (year 2). Hence, the program was available for both years for this cohort. For the students who were in grade 5 in year 1, the program was available only in that year. Grade 3 students (who had been in grade 2 in year 1) were added as part of the intervention in year 2.

Table 2
Test for differences in the mean baseline test scores.

	Math	English	Science	Bengali	GK/IQ
Grade 4	**Year 1 (Baseline)**				
Difference	0.0587	−0.0391	−0.0282	0.0228	−0.0179
S.E	(0.0411)	(0.0416)	(0.0382)	(0.0428)	(0.0362)
N	$T = 1244$	$C = 1059$			
Grade 5					
Difference	−0.0461	−0.0683	0.0159	−0.0541	0.0021
S.E	(0.0404)	(0.0430)	(0.0444)	(0.0432)	(0.0419)
N	$T = 1046$	$C = 717$			
Grade 3	**Year 2 (baseline)**				
Difference	−0.0592	−0.0055	0.0210	0.0351	0.0592
S.E	(0.0391)	(0.0384)	(0.0412)	(0.0400)	(0.0399)
N	$T = 1222$	$C = 1185$			

Notes: This table gives the simple mean differences in normalized pre-intervention test scores between the treatment and control school students, conducted at the beginning of the academic year. The control group mean and standard deviation are 0 and 1, respectively. Standard errors (S.E) of the differences are presented in the second row in brackets. None of the differences are statistically significant at 10% level.

had been in grade 2 in year 1) at the same treatment schools, adding an extra 2408 students. As the students who had been in grade 5 in year 1 moved to secondary schools in year 2, only the parents of students who were in grade 4 in year 1 attended meetings in both year 1 and year 2 (see Table 1 for treatments by grade and year). There were eight meetings held in year 2, starting in March.[14]

A standardized baseline test was carried out before the intervention started, followed by midline tests at the end of year 1 (in December 2011) and final follow-up tests at the end of year 2 (in December 2012). Students in both the treatment and control groups were tested on their knowledge of mathematics, English, science, and Bengali on baseline, midline, and end-line tests. In year 2, we also assessed reading, writing, and general knowledge/intelligent quotient (GK/IQ) abilities for students in both the treatment and control schools. The tests were developed with the help of retired primary school teachers, local educational professionals, and teacher trainers. These project specific tests were graded by a team of retired school teachers and experienced tutors. The current school teachers played no direct role in either conducting the tests or grading the exam papers.[15] We also surveyed the students on their perspectives, time spent on various activities, and non-cognitive and behavioral outcomes. Finally, more than one year after the completion of the program, we conducted a household survey of approximately 50% of the households to determine the persistence of the effects among the parents, examining parental time allocation and perceptions regarding the meetings and their children's educational progress.

2.2. Descriptive statistics

Table 2 shows the differences (and the *t*-statistics) in the baseline test scores (conducted in year 1) between the treatment and control groups for the grade 4 and 5 students in mathematics, English, science, and Bengali, as well as the respective scores and statistics for the grade 3 students who were in the program in year 2. The test scores reported are normalized relative to the distribution of the baseline test scores of the control group.[16] The test questions were focused on

[14] There were more meetings in year 2 than in year 1, because the intervention in year 1 started a few months after the start of the academic year, as we needed to conduct the baseline test and get approval from schools and the government to conduct the meetings.

[15] The tests were administered separately by the implementing NGO (GDRI). However, PSC exams are conducted by education boards. The boards appoint external graders who are anonymous. For grade five students, the estimates are based on the PSC test scores. For students in other grades the estimates are based on the project specific test conducted by GDRI. Tests conducted by school teachers were used only for the report card, and we did not use school administered test scores for the purpose of evaluation.

[16] The scores were normalized for each group of students for each test, meaning that the mean and standard deviation of the control group at the baseline were 0 and 1, respectively.

Table 3
School and teacher characteristics.

	Treatment	Control	Diff	S.E
	I	II	III	IV
Number of teachers	5.23	4.78	0.45	0.33
Number of female teachers	2.80	2.56	0.24	0.35
Number of students in grades 4 and 5	60.78	61.32	−0.55	6.53
Number of classrooms	4.22	4.35	−0.13	0.32
Student–classroom ratio	50.63	53.33	−2.70	6.21
Years in a teaching job (experience)	10.94	8.76	2.18***	0.96
Amount of professional training	1.02	0.91	0.11	0.12
Years of education	18.75	20.18	−1.43***	0.23
Distance travelled from home to school (km)	5.00	4.07	0.93	0.81
Monitoring of schools by TEO* (satisfactory)	0.68	0.64	0.04	0.05
Electricity connection in school area	0.68	0.58	0.10	0.11
Drinking water facility	0.13	0.22	−0.09	0.09

Notes: This table gives the average characteristics of the treatment and control schools, and the differences before the intervention begins in year 1 (2011). Standard errors (S.E.) of the differences are presented in columns (IV). Statistically significant differences are marked as stars. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
*TEO = Thana (sub-district) Education Officer

problems and questions from the textbooks, and in addition, we also conducted separate tests that aimed to give us a better understanding of students' quantitative skills (e.g., numeracy, charts), English skills (e.g., sentence completion, translation), and general knowledge or intelligence (a GK/IQ test). The GK/IQ tests were developed by local educators and are not based on the textbooks. Our results suggest that there are no statistically significant differences between the means in the baseline test scores of different subjects of the control and treatment groups.

Table 3 reports statistics on the schools' and teachers' characteristics. There are no statistically significant differences in the student–classroom ratios,[17] student–teacher ratios, distances that teachers commute to the school, numbers of teachers, numbers of female teachers, numbers of classrooms, or post-job training opportunities. The teachers in the treatment schools do appear to be more experienced than their control counterparts, but have lower education levels. Thus, there are no systematic differences between the treatment and control schools regarding the characteristics of the students, teachers, or school facilities.

2.3. Attrition

Drop-outs and absences from classes and exams are very common, especially in the early stages of primary school in the rural areas of developing countries. It is important to consider that this intervention could have unintended consequences. For example, weak students might drop out as a result of their parents meeting with their teachers if the meetings led to the parents giving up hope for their children. If student attrition rates differ between the treatment and control groups, failing to account for the difference could bias the estimation results. Table A1 in Appendix A shows that the attrition rate was low in both the treatment and control schools, and was similar between the treatment and control schools across grades and years. The attrition rates in year 1 by the midline test for grade 4 students were 7.4% and 4.6% in the treatment and control schools, respectively. There was no attrition among grade 5 students in year 1, while the attrition rate for grade 5 students in year 2, who had sat for the baseline test in grade 4, was 5.8% in the treatment schools and 6.9% in the control schools. We observed higher rates of attrition for grade 3 students in both the treatment and control schools, at 11.6% and 11.8%, respectively, due largely to students who drop out of school before grade 4.[18] However, the field staff made a special effort to minimize the attrition among students who had not dropped out of school by the time of the tests. All of the students and parents in both the treatment and control schools were reminded about the test, and field staff visited the students' homes to encourage them to attend school on the test day.

Overall, the attrition rate was lower than those in many other similar programs, such as the Balsakhi Program in India administered by Pratham (see Banerjee et al., 2007) and the tracking of students in Kenya by Duflo et al. (2011), where nearly 20% of children were absent on test days. Furthermore, the baseline test scores of the children who missed the midline and end-line exams at the treatment and control schools do not differ significantly (see Table A2), indicating that the factors that lead to attrition are the same in the two groups.

[17] There is always a single classroom for each grade in each school.

[18] Anecdotal evidence suggests that teachers do not promote many low-performing students to grade 4 because schools are required to have a very high percentage of students passing the grade 5 PSC exam. A failure to do so could result in the suspension of a school's registration, a loss of additional funding, or disciplinary action against teachers. Thus, teachers try to promote to grade 4 only students who are likely to pass grade 5, and filter out other students early in order to avoid having to explain a sharp drop in student numbers between grades 4 and 5. We also verified this record with the schools by considering children who were promoted to grade 4 before the intervention started in 2011. We found that almost 12% of students were dropped out in the progression from grade 3 to grade 4.

We also examined the correlates of attrition. We estimated a probit model of the overall attrition on treatment status, and also add interactions of treatment variable with students', parents' and schools' characteristics. Results are presented in Table A3. Overall, we do not see any difference in attrition by treatment status or by gender of the students. High ability students (students with higher baseline test scores) are less likely to drop out, but they do not differ by treatment status as interaction with treatment indicator is insignificant statistically. When we interact treatment status with household, teacher or school characteristics none of the interaction terms are significant, implying that there is no differential attrition across treatment groups based on these characteristics. This means that the results presented in the next section are unlikely to have been biased by attrition.

The results could also be biased if the children who dropped out of the sample (missed the midline or end-line tests) differ in other dimensions. Thus, we examine whether the missing students led to an attrition bias by following Lee (2009) in calculating conservative bounds on the true treatment effects under the assumption that the same forces are driving attrition in both the treatment and control groups, even if the two samples have different attrition rates. The results are reported in Table A4. In our case, we do not see any significant impact on our estimates because the attrition is quite small and is similar in the treatment and control schools.

3. Outcomes and methods

The main outcomes of interest here are project-administered standardized test scores and PSC exam results at grade 5.[19] Learning outcomes are measured by standardized tests for math, English, Bengali, and science. In addition, at the end of year 2, the project also administered a test for English reading, English writing, and GK/IQ that was not part of the regular academic curriculum or testing regime.

Another outcome of interest is the presence of parents at the meetings. Parents' meetings with teachers at the schools were completely voluntary. We examine the numbers of meetings attended by parents or guardians. The parents who decided to come to the meetings are likely to have different characteristics from those who did not, and we therefore examine the correlates of parental presence at the meetings. Face-to-face meetings between parents and teachers are likely to reduce absenteeism by both students and teachers. The students' test scores are expected to be influenced by the presence of teachers in the classroom and at school. Teacher efforts could also change as a result of meeting with parents on a regular basis to discuss their children's progress. We record teacher presence in the treatment and control schools based on several random visits to schools by anonymous counters, and also examine their pedagogical practices and efforts in the classroom. We examine student absenteeism along with the effects of (a) the students' time use, study habits, and confidence; (b) the teachers' perceptions about students; and (c) parental efforts to help their children at home.

The randomized assignment of schools into the treatment and control groups produced balanced test scores at the baseline. The main parameter of interest is intent-to-treat (ITT) effects, which are the average of the causal effects for all children whose parents were invited to participate in the meetings. While the schools were selected randomly to belong to the treatment or control groups, there was no selection within the treatment schools: all parents with students in the grades under study were invited to participate in the meetings. We ran the following regression model for estimating the ITT effect on test scores:

$$y_{i,post} = \beta_0 + \beta_1 y_{i,base} + \beta_2 treatment_i + v_i, \quad (1)$$

where $y_{i,\ post}$ is the test score of a student at either the midline or the end-line; $y_{i,\ base}$ is the baseline test score for student i; and $treatment_i$ is a dummy variable that takes a value of 1 if the observation is in the treatment group and 0 otherwise. The differences in the changes in test scores between the two groups are measured by $treatment_i$. Eq. (1) is estimated separately for each subject using OLS. Standard errors are always clustered at the school level. We also run the regression separately for male and female students.

β_2 is the ITT effect, and reflects the effects on all children of the same grade in the treatment schools whether their parents attended any meetings or not. There were multiple meetings (five in year 1 and eight in year 2), all of which were completely voluntary, and parents could come to any number of meetings. Most of the parents participated in at least one meeting (see Section 5.2.2 for more details).

We examine the heterogeneity in treatment effects and parents' participation in meetings, and report these results for girls and boys separately. We also examine the heterogeneity by parents', teachers', and schools' characteristics. For example, the parents of a boy might be more likely to come to meetings than those of a girl. Therefore, we examine parental presence based on the genders of the children in the treatment schools. We also examine the underlying mechanisms in order to determine whether the improvement is due to parental efforts or to additional efforts by teachers or students. Finally, we provide evidence of any possible spillover effects that may occur due to parents' interactions with other parents or information about such meetings taking place in schools, for example.

[19] The exams conducted by the schools differ across schools, so we did not consider them in our analysis. For the purposes of this study, we conducted the same tests in all treatment and control schools. We also used nationwide, externally-administered public exam results for the grade 5 students.

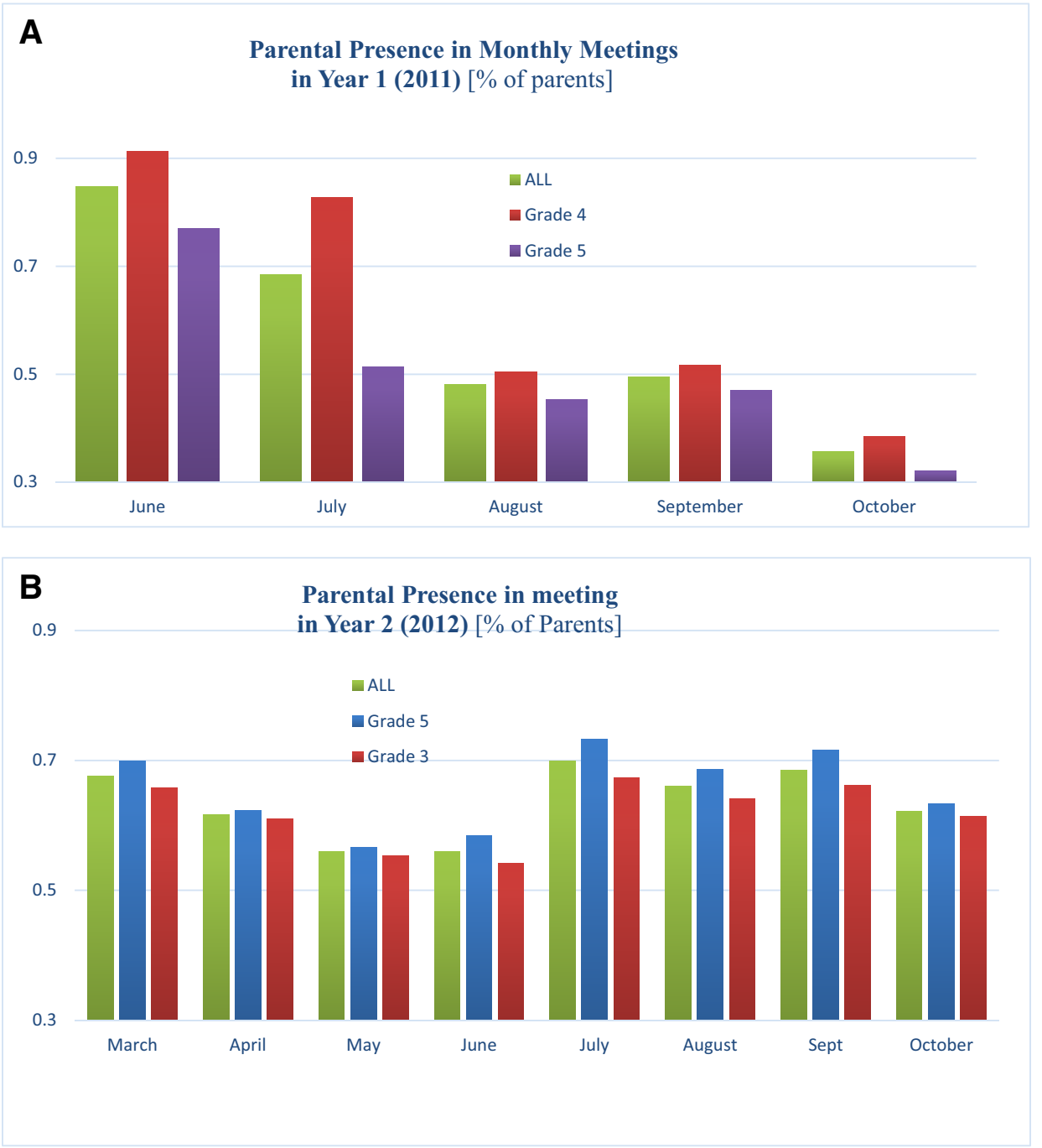


Fig. 2. A: Parental Presence in Monthly Meetings in Year 1 (2011) [% of parents]. B: Parental Presence in meeting in Year 2 (2012) [% of Parents]
Note: Figure shows the percentage of parents attended the meeting in each month, by grade of the children and overall (ALL).

4. Results

4.1. Parental participation at meetings

Fig. 2A and B shows the presence of parents at the meetings in years 1 (2011) and 2 (2012) for all students and by the children's grade level. We observed that almost 85% of parents attended the first meeting in year 1, but that this declined over the following meetings. After three monthly meetings, in September 2011, the schools' headmasters sent letters (in

envelopes) encouraging parents to attend meetings at the schools that month. The letters were sent to understand whether parents attached special importance to the meetings following the receipt of a letter. In Fig. 2A, we see that parental presence in September actually increased slightly. However, the October meeting had the lowest parental presence of all of the meetings.

Eight meetings were held in year 2, starting early in the academic year. On average, parents attended three meetings out of five in year 1, and five meetings out of eight in year 2. As mentioned, the grade 5 students from year 1 moved to secondary schools in year 2, so their parents were no longer invited for the meetings, which took place only in primary schools. The parents of the students who were in grade 4 in year 1 (grade 5 in year 2) were invited to have meetings with the teachers again in year 2. In addition, all of the parents of students in grade 3 were invited to the meetings for the first time in year 2.

Fig. 2B shows that nearly 70% of parents attended the first meeting in year 2, with a slightly higher presence of the parents of students in grade 5. The presence of the parents of students in grade 3 was relatively low, supporting the anecdotal evidence that parents are generally less concerned or motivated when their children are in the lower grades of primary school. The participation rates differ by month, among other factors, depending on the day of the meeting (rainy or hot day), the season (harvesting or planting period), or religious activities (Hindus and Muslims have different religious days, and some are not public holidays).[20]

Figures A1A and A1B in Appendix B show that parental presence did not differ significantly based on the gender of the child in either year. When looking at meeting attendance by mothers or fathers, we see that, in general, the presence of mothers gradually increased (Figures A2A and A2B), for both the first and second years of meetings. Regarding the number of meetings attended, we see that more than 40% of parents attended four or five (out of five) meetings in year 1 (Figure A3A), and more than 70% of parents attended more than half of the meetings (four or more of the eight meetings) in year 2 (Figure A3B).

We examine the correlates of parental presence at meetings using various demographic and socioeconomic variables as the controls in a regression analysis, considering the numbers of meetings in which parents participated to be an outcome of interest. We run a Poisson regression model because the dependent variable is an integer that describes a countable factor—the number of meetings. An OLS regression provided similar results. The estimated average marginal effects from the Poisson regression presented in Table 4 show that parental education and household income are not significant predictors of attendance at meetings in either year 1 or year 2.[21] We find that the baseline GK/IQ test score, baseline English test score, and age of the household head predict the number of meetings attended, but only in either year 1 or year 2, and the magnitudes of the effects are relatively small. In general, we do not see any strong determinants of parental presence at meetings. It seems that parents of all ages, education levels, and income levels participated.

4.2. Effects on Test Scores

4.2.1. Intent-To-Treat Effects

Table 5 reports the coefficients from OLS regressions that used test scores at the midline as the dependent variables and baseline test scores for the control (using Eq. (1)). Table A5 in Appendix A reports the corresponding results using simple differences in the midline test scores (without conditioning on the baseline test scores). The results are reported using the students' current grade level, not their starting grade level. The midline test results in Table 5 indicate that grade 4 students in the treatment schools gained almost 0.22 SD in math and 0.36 SD in English at the end of the first year of the program. The grade 5 students were not assessed separately as part of the project, but sat for the nationwide competitive exams (PSC exams) at the end of grade 5. This is a high-stakes test that all students must take and pass in order to progress to secondary school. We obtained official test scores (cumulative grade point averages, CGPA) from the PSC exams for all students at the schools. The coefficients indicate that students in the treatment schools have CGPAs that are 0.2 SD higher. This represents a 7.5% increase in test scores over the control children in grade 5 at the end of the first year of the intervention.[22] The grade 5 results are based on the PSC exam results, which are not available separately by subject for year 1, and we have only overall CGPA results available for year 1, as we had not yet been able to obtain permission to get the subject-specific PSC marks by that time. However, we were able to obtain PSC exam test scores for each subject for each student in year 2.

[20] We also observed a decline in parental presence in meetings in 2012 (Figure 2B). In June 2012, teachers again sent parents envelopes with letters from the head teacher encouraging them to come to the next meeting. We observed a slight increase in parental presence in that month. Following teachers' and field staff members' recommendations and requests (as parents desired), we attempted to encourage more parents to come to the meetings by offering entertainment (e.g., sweets) at the July meeting. The entertainment plans were announced at the June meeting, and those absent from that meeting were informed later by program staff members. We observed a significant increase in parental presence at the July meeting compared to June, and therefore offered the parents sweets at each meeting over the following three months, during which there was no significant drop in parental presence. The behavior of these parents do not differ much of what Fryer and Holden (2012) found in USA. They provided incentives to parents (as well as teachers and students) to raise educational (math) achievement of children in Houston. They find that parents attended twice as many parent-teacher meetings when they were given incentives.

[21] Note that most parents in the areas are low income and low educated, and all parents were encouraged and reminded to attend the meetings. Thus, these results do not mean that either education or income is unimportant for child schooling, nor do they contradict the findings from previous studies that have suggested that parental education and income play an important role in child schooling.

[22] The raw mean CGPAs for the treatment and control school students were 3.49 and 3.24, respectively.

Table 4
Correlates of parental presence at meetings (Poisson Regression Model).

Dependent variable:	(1)	(2)	(3)	(4)
Number of meetings attended	Year 1		Year 2	
Age of the household head	−0.00193	−0.00199	−0.00441**	−0.00228
	(0.00277)	(0.00276)	(0.00179)	(0.00178)
Household size	0.0102	0.00681	0.00941	0.00287
	(0.0148)	(0.0130)	(0.00842)	(0.00866)
Head above primary education	−0.0505	−0.0313	0.0266	0.0312
	(0.0431)	(0.0351)	(0.0330)	(0.0360)
Mother above primary education	0.0224	0.0167	0.0158	−0.0179
	(0.0429)	(0.0370)	(0.0230)	(0.0208)
(Log) household income	−0.136	−0.100	0.0403	0.0370
	(0.0734)	(0.0658)	(0.0382)	(0.0380)
Gender of household head	0.0693	0.0731	0.175**	0.147*
	(0.0709)	(0.0867)	(0.0690)	(0.0800)
Gender of student (female = 1)	0.00731	0.0110	−0.0137	−0.0193
	(0.0268)	(0.0218)	(0.0143)	(0.0156)
Grade dummy (grade five = 1)	−0.168	−0.140	0.0485	−0.00837
	(0.0908)	(0.0894)	(0.0325)	(0.0389)
baseline Bengali		0.00786		0.00407
		(0.0300)		(0.00930)
baseline English		−0.0228		−0.0174**
		(0.0162)		(0.00800)
baseline mathematics		−0.00642		0.000530
		(0.0179)		(0.00611)
baseline science		−0.0156		0.0116
		(0.0286)		(0.00715)
baseline GK/IQ		0.0529*		0.000907
		(0.0245)		(0.0106)
Observations	2232	2016	1728	1376

Notes: The last column is based on students from grade 5, as baseline marks for grade 3 students are missing. The sample for year 1 includes the students in grades 4 and 5 (and their parents, in this table) in that year, while the sample for year 2 consists of those in grades 5 and 3 in year 2. The overall sample size is smaller than the total number of students, as the parental survey was conducted on a subset of samples selected randomly. Standard errors are clustered at the school level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5
ITT estimates of test scores: midline results, year 1 (2011).

	(1)	(2)	(3)	(4)	(5)	(6)
	Grade 4					Grade 5
	Math	English	Science	Bengali	ALL	CGPA
Treatment effect	0.224*	0.362**	0.139	0.306***	0.260**	0.200**
	(0.118)	(0.138)	(0.115)	(0.112)	(0.115)	(0.0966)
Baseline test score	0.376***	0.370***	0.396***	0.0986**	0.553***	0.0787
	(0.0461)	(0.0558)	(0.0475)	(0.0473)	(0.0534)	(0.0565)
Observations	2197	2203	2202	2204	2204	1768
Adjusted R^2	0.149	0.145	0.120	0.031	0.195	0.014
Male ($N = 1072$)						
Treatment effect	0.237*	0.398***	0.151	0.320**	0.259**	0.348***
	(0.128)	(0.132)	(0.120)	(0.123)	(0.118)	(0.102)
Female ($N = 1025$)						
Treatment effect	0.209*	0.319*	0.123	0.283**	0.254**	0.209*
	(0.123)	(0.162)	(0.129)	(0.120)	(0.124)	(0.123)
Male-Female diff	0.0323	0.0774	0.0247	0.0360	0.00476	0.139***
p-value	[0.724]	[0.444]	[0.804]	[0.714]	[0.953]	[0.001]

Notes: This table gives the OLS regression-adjusted treatment effects, conditioning on the baseline test scores (using Eq. (1)). The midline tests were conducted after year 1 of the intervention. 'ALL' represents the average of the test scores for all subjects (math, English, science, and Bengali). The test scores are normalized, with the baseline mean and standard deviation of the control group being 0 and 1, respectively. We used average pre-intervention test scores from all subjects to control for their ability in the regressions for these subjects. Standard errors are clustered at the school level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The difference in coefficients between male and female children and p-values of the differences are reported in the last two rows of the table (for each grade students separately).

Table 6
ITT effects on test scores: end-line results, year 2 (2012).

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ALL Grade 5 ($N = 1870$)	Math	English	Science	Bengali	ALL	GK/IQ	Reading	Writing
Treatment effect	0.420***	0.413***	0.339***	0.309***	0.377***	0.235*	0.244*	0.190
	(0.129)	(0.126)	(0.106)	(0.100)	(0.0990)	(0.128)	(0.148)	(0.146)
Baseline test score	0.210***	0.171***	0.219***	0.167***	0.281***	0.412***	0.219***	0.258***
	(0.0552)	(0.0579)	(0.0386)	(0.0406)	(0.0616)	(0.0844)	(0.0605)	(0.0971)
Adjusted R^2	0.100	0.067	0.086	0.070	0.135	0.120	0.041	0.042
Male ($N = 950$)								
Treatment effect	0.370**	0.424***	0.324***	0.374***	0.377***	0.268**	0.184	0.143
	(0.142)	(0.140)	(0.121)	(0.114)	(0.108)	(0.127)	(0.153)	(0.138)
Female ($N = 920$)								
Treatment effect	0.469***	0.401***	0.340***	0.245**	0.371***	0.203	0.304*	0.242
	(0.136)	(0.129)	(0.112)	(0.106)	(0.103)	(0.153)	(0.161)	(0.179)
Male-Female diff	−0.0992	0.0170	−0.0188	0.130	−0.0000549	0.0676	−0.123	−0.0972
p-value	[0.354]	[0.867]	[0.854]	[0.142]	[0.999]	[0.548]	[0.238]	[0.448]
Panel B: ALL Grade 3 ($N = 2253$)								
Treatment effect	−0.0873	0.317***	0.332***	−0.00594	0.141	0.00906	0.0529	0.127
	(0.0787)	(0.0907)	(0.107)	(0.107)	(0.0860)	(0.0937)	(0.126)	(0.149)
Baseline test score	0.304***	0.314***	0.318***	0.339***	0.489***	0.358***	0.221***	0.219***
	(0.0334)	(0.0367)	(0.0391)	(0.0381)	(0.0482)	(0.0402)	(0.0543)	(0.0657)
Adjusted R^2	0.091	0.101	0.125	0.120	0.179	0.080	0.029	0.027
Male ($N = 1127$)								
Treatment effect	−0.0796	0.266***	0.331***	−0.0368	0.125	0.0427	0.00860	0.203
	(0.0871)	(0.0928)	(0.106)	(0.102)	(0.0828)	(0.105)	(0.135)	(0.137)
Female ($N = 1126$)								
Treatment effect	−0.0959	0.367***	0.331***	0.0247	0.156	−0.0245	0.0969	0.0512
	(0.0929)	(0.110)	(0.123)	(0.123)	(0.103)	(0.112)	(0.136)	(0.177)
Male-Female diff	0.0152	−0.0999	0.0000694	−0.0629	−0.0313	0.0676	−0.0887	0.152
p-value	[0.861]	[0.284]	[0.999]	[0.388]	[0.673]	[0.538]	[0.375]	[0.150]

Notes: This table gives the OLS regression-adjusted treatment effects, conditioning on the baseline test scores (using Eq. (1)). The end-line tests were conducted after year 2 of the intervention. 'ALL' represents the average of the test scores for all subjects (math, English, science, and Bengali). The sample sizes differ slightly, as some students' test scores were missing or not reported in one or more subjects. The test scores are normalized, so that the baseline mean and standard deviation of the control group are 0 and 1, respectively. For GK/IQ, reading and writing, the test scores are normalized at the end-line, with the control mean and standard deviation being 0 and 1, respectively. 'Baseline test score' is the pre-intervention test score for the respective subjects except GK/IQ, Reading and Writing. There was no baseline test conducted for GK/IQ, Reading and Writing. We used average pre-intervention test scores from all subjects to control for their ability in the regressions for these subjects. Standard errors are clustered at the school level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The difference in coefficients between male and female children and p-values of the differences are reported in the last two rows of each panel (for each grade students separately).

When looking at the distribution of test scores, we see that the percentage of students with higher CGPAs was higher, while the percentage of students with lower CGPAs was lower at the treatment schools than at the control schools (see Figure A4). Overall, boys and girls gain equally: combining all subjects, we observe no differences between male and female children in terms of gains in test scores in grade 4. However, for grade 5 students, the increase in CGPAs is higher for boys (0.35 SD) than for girls (0.21 SD).

Table 6 reports the regression results (using Eq. (1)) for the end-line (year 2) test scores for students in grades 5 and 3.[23] As was mentioned earlier, the meetings took place only in primary schools. Students who were in grade 5 at the midline (year 1) had moved to grade 6 (secondary school) by the end-line (year 2). The regression results suggest that the students who were in grade 5 at the end-line gained in all subjects, with the highest increases occurring in math (0.42 SD) and English (0.41 SD), respectively. Considering all subjects (Math, English, Science, and Bengali), the average increase in test scores at the end of year 2 is 0.38 SD for grade 5 students who were in the program for two successive years. Comparing the ITT estimates of the gains in the midline (Table 5) and end-line (Table 6) test scores, we observe net gains in the second year of the program of 0.1–0.2 SD, depending on the subject. We also administered a separate test for all students at the end-line in order to assess their reading and writing skills and GK/IQ. We see large gains in these areas, with the reading scores increasing by 0.24 SD and the GK/IQ test scores by 0.23 SD. We also observe an increase in writing scores of 0.19 SD, though the coefficient estimate is not significant statistically. The raw mean scores for the control (treatment) students in reading and GK/IQ are 6.69 (7.47) and 5.19 (5.64), respectively. These indicate that the students at the treatment schools improve on the control school students by approximately 11.6% and 8.7% in reading and GK/IQ, respectively.

The students who were in grade 3 in year 2, whose parents were invited for meetings only in year 2, have relatively low gains. They made no gains in math and Bengali, but their test scores in English and science increased significantly, by 0.32

[23] Appendix Table A6 reports the corresponding results for end-line simple mean differences in test scores.

SD and 0.33 SD, respectively. We observe statistically insignificant gains in reading, writing, and GK/IQ scores of 0.027 SD, 0.127 SD, and 0.06 SD, respectively. The results suggest that while the grade 3 students also benefited from their parents meeting with their teachers, the gains are relatively modest compared to those for the grade 5 students in both years. These small gains are also associated with smaller percentages of parents of grade 3 students attending the meetings, presumably because the stakes are not as high as at the grade 5 level (Fig. 1B).[24]

We take the differences in parents', teachers', schools', and children's characteristics into account using the following regression model:

$$y_{i,post} = \alpha_0 + \alpha_1 y_{i,base} + \alpha_2 treatment_i + \alpha_4 X_i + u_i, \quad (2)$$

where X_i is a vector of control variables that describe school resources, teachers' characteristics, and parental characteristics.[25] The results for Eq. (2) are reported in Tables A7 and A8 in Appendix A, and confirm the findings obtained by controlling only for baseline test scores (as in Tables 5 and 6) or by using simple differences in post-treatment test scores (Tables A5 and A6).[26] Overall, the results remain robust whether or not we control for the characteristics of households, parents, teachers, and schools.

While the effects of the parent–teacher meetings may initially seem large, the magnitudes are plausible given that the intervention was carried out in remote rural primary schools in a developing country. Students from such low socioeconomic backgrounds are more likely to benefit the most from such interventions. We compare our results with those from several other successful interventions in developing countries. Andrabi et al. (2017) found that test scores increased by 0.11 SD as a result of their village-level information campaign intervention in Pakistan. The Balsakhi program in urban India, which provided low-performing students with additional teaching hours with a contract teacher (the Balsakhi), increased test scores by an average of 0.14 SD in its first year (Banerjee et al., 2007). The Extra Teacher Program in Kenya (Duflo et al., 2011), which also hired contract teachers, resulted in a 0.31 SD gain. The Computer-Assisted Learning program (Banerjee et al., 2007), which was also conducted in urban India, increased math scores by 0.36 SD in its first year. However, although these interventions had positive impacts on the students' performances, they were costlier and had generally smaller treatment effects than our intervention.[27] A recent study of technology-aided instruction in India by Muralidharan et al. (2017) found relatively stronger effects (0.36 SD in math and 0.22 SD in Hindi) for an intervention that lasted only four and a half months.

4.2.2. Treatment-on-treated effects

When the take-up is low, the TOT effect can be evaluated separately. In the treatment schools, 90% of the students' parents attended at least one of the five monthly meetings in year 1, while more than 95% of parents attended two or more meetings in year 2. On the other hand, no structured monthly parent–teacher meetings like the intervention took place at the control schools. Thus, there is a powerful first-stage effect of assignment in the treatment school on parent–teacher meetings. Hence, the TOT effect here is likely to be very close to the ITT effect presented. In practice, one could estimate the TOT parameter by using the variable "Attend" to indicate whether or not a parent attended a meeting, with assignment to a treatment or control school as an instrument, and then running two-stage least squares. [28] In our case, the TOT effect is the ITT/percentage of parents attended at least one meeting. With at least one meeting attendance of nearly 90%, the TOT parameter is approximately 1.1 times as high as the ITT estimates presented in Tables 5 and 6.

Next, we examine whether the children of parents who attended more meetings tend to achieve higher test scores. Table A9 reports the results from a regression of end-line test scores on the number of meetings, conditioning on parental, teacher, and school characteristics. For estimates in Table A9, we run the regression among only treatment school students. The results indicate that an additional meeting is associated with a 0.10 SD–0.15 SD increase in test scores, depending on the students' subjects and grades. Note though that these results cannot be interpreted as causal effects, since the decision to participate in a given number of meetings is endogenous.[29]

However, the incremental benefit of an extra meeting with teachers may not be constant. As parents learn more about their child's level and progress by attending a few meetings, or perhaps even only one, the benefit of having more meetings is likely to diminish. On the other hand, attending more meetings might make parents feel more confident about asking

[24] As has been mentioned, the stakes in the grade 3 exam are not high, and a lot of students drop out before they reach grade 5. Parents are generally more concerned about their children once they reach grade 5.

[25] X includes variables such as age of the household head, education of the father and mother separately, income of the household, child gender, student-teacher ratio, experience of the head teacher, number of classrooms in schools, whether school is brick built, and whether school has electricity connection.

[26] The sample sizes using parental controls are smaller, as is shown in Tables A7 and A8. We surveyed about 60% of the parents from both the treatment and control schools.

[27] It is to be noted that the effect sizes cannot be compared directly because of differences in assessment. Nevertheless, we chose to consider results from some similar studies in order to put things in perspective.

[28] The first first-stage of the two-stage estimates would consist of running an OLS regression of attendance in a parent-teacher meeting on whether a child is under treatment or control school as an instrument. The second-stage involves, using the predicted value from the first-stage, and run the regression of test scores on predicted participation status as the main variable of interest. However, note that a parent could have attended any number of meetings (five meetings in year 1 and eight meetings in year 2). Because the decision to attend the number of meetings is also endogenous the simple binary treatment status would not capture the *intensity* of the participation status in the program. We therefore do not report ToT effects. Note that ITT is also policy relevant in this context since one would be interested to know the impact if the program is scaled up.

[29] These results are suggestive and likely to be upward biased as parents who missed a meeting could have met teachers in other times.

Table 7
Distribution of treatment effects.

Panel A: Midline Results (Year 1: 2011)

	(1)	(2)	(3)	(4)	(5)	(6)
	Math	English	Science	Bengali	ALL	CGPA
	Grade 4					Grade 5
Low Ability	0.320**	0.243	0.0848	0.192	0.225*	0.153
	(0.155)	(0.160)	(0.123)	(0.156)	(0.122)	(0.169)
Middle Ability	0.177	0.225	0.135	0.286*	0.188	0.105
	(0.149)	(0.148)	(0.164)	(0.150)	(0.140)	(0.165)
High Ability	0.433**	0.499**	0.288	0.466***	0.440**	0.349*
	(0.173)	(0.215)	(0.198)	(0.159)	(0.172)	(0.176)

Panel B: End-line Results (Year 2: 2012)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Grade 5	Math	English	Science	Bengali	ALL	GK	Reading	Writing
Low Ability	0.358*	0.137	0.183	0.325*	0.268	0.290**	0.123	0.133
	(0.208)	(0.229)	(0.179)	(0.162)	(0.175)	(0.126)	(0.201)	(0.157)
Middle Ability	0.406**	0.283*	0.269	0.346***	0.327**	0.305*	0.109	0.230
	(0.169)	(0.169)	(0.174)	(0.127)	(0.145)	(0.154)	(0.200)	(0.188)
High Ability	0.368*	0.479**	0.316**	0.107	0.307*	0.251	0.384**	0.325
	(0.197)	(0.198)	(0.155)	(0.168)	(0.154)	(0.296)	(0.177)	(0.277)
Grade 3								
Low Ability	−0.0519	0.327**	0.432***	0.0618	0.198	−0.00724	−0.0268	0.211
	(0.140)	(0.135)	(0.135)	(0.129)	(0.120)	(0.164)	(0.175)	(0.181)
Middle Ability	−0.0773	0.386***	0.411***	0.0933	0.208*	0.123	0.0945	0.177
	(0.129)	(0.129)	(0.147)	(0.151)	(0.120)	(0.170)	(0.173)	(0.160)
High Ability	−0.126	0.295*	0.177	−0.140	0.0705	−0.0658	−0.0275	0.235
	(0.161)	(0.173)	(0.139)	(0.186)	(0.156)	(0.138)	(0.159)	(0.251)

Notes: This table reports the OLS regression coefficients using Eq. (2) for sub-samples of students in different ability groups, based on their baseline test scores. 'High ability' refers to students who fall in the top 33% of the baseline marks distribution, while 'low ability' refers to students in the bottom 33% of the marks distribution. The regression includes child gender, parental and household characteristics, and teacher and school characteristics. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

questions or interacting with teachers. Hence, attending more meetings could enhance the likelihood of effective interactions and engagements with teachers.

4.3. Distribution of treatment effects

We next check whether the program had heterogeneous effects depending on students' abilities (baseline test scores) before the intervention. We split the students into three groups (as per Banerjee et al., 2007): top, middle, and bottom thirds by their rankings in the baseline test distribution,[30] and estimated Eq. (1) separately for each of the three groups. The results, without controlling for covariates, are similar, and are not reported here for the sake of brevity. Table 7 reports the estimated treatment effects for the three groups. It appears that the high ability students (top 33%) gained the most at the midline tests, and the differences in gains relative to their counterparts in the middle ability (middle third) and low ability (bottom third) groups are also statistically significant. In grade 4, after year 1 of the intervention, the high ability students' overall test score gains are almost double those of the low ability students (0.49 SD vs. 0.26 SD). The treatment effect is positive and highly significant for students in the top third (high ability) for all subjects except for science, in the low ability only for math and English, and in the middle ability only for Bengali. The high ability students in grade 5 also have more than double the gains of other students in CGPA scores. These gains are higher both separately for all of the individual subjects of the grade 4 students and for the overall GPA of the grade 5 students. Thus, in the short term, the meetings in year 1 benefited the high ability students most.

However, at the end of the second year, we see that the effects are quite similar across student groups, with the lower ability students gaining almost as much as the higher ability students. The gains in the overall test scores are not statistically different across the three groups of students in grade 5 (who were also in the program in grade 4), which suggests that the incremental gains from ongoing parent–teacher meetings are higher among low ability students, although they might not benefit in the very short term. It is also possible that these parents take longer to prepare themselves to be able to help their children at home. However, it should be noted that though the difference in the gains in test scores among these

[30] We used an average over all subjects when ranking students.

groups of students diminished over time, we still observed some significant differences across subjects, especially between the low-ability and high-ability students, in English, science, and Bengali.

Among grade 3 students, some evidence from our findings suggests that the positive gains accrue more to the lower ability (bottom and middle thirds) of students. We only find statistically significant gains in English, science, and the overall test scores, with mid- and low-ability students seeing the highest gains. Low-ability students might be benefiting more from more frequent interactions with their parents. More meetings between parents and teachers could lead to more interactions between students and parents. There were more meetings with teachers in year 2. These frequent meetings might make the parents more comfortable in interacting with teachers and other parents, thus allowing them to learn more.[31] Thus, it is worthwhile to incentivize or nudge parents to attend meetings, especially the parents of low-ability children. Indeed, we see that meeting attendance is higher among the parents of lower-ability students in grade 3 than among their counterparts in grade 5, while the attendance of parents of high-ability grade 3 students is lower than that of their grade 5 counterparts (Figure A5). This finding suggests that more frequent meetings could be associated with better performances among lower-ability children in the classroom.

Finally, we examine the heterogeneous treatment effects based on parental and household characteristics of the children, as well as schools and teachers' characteristics. The results using OLS are reported in Table A10 in appendix. We discuss the results in appendix D. Overall, the evidence indicates that the impact of the intervention did not vary significantly across the characteristics of the participating students' families, teachers, or schools.

4.4. Mechanisms

Parent–teacher interactions at these meetings could influence the children's educational outcomes in a number of ways. As has been discussed, any parent–teacher meetings would be likely to affect the behaviors of teachers, parents, and students. For example, Avvisati et al. (2014) found parent–school meetings to lead to improvements in the behaviors and attitudes of children, as well as to increased school and home-based activities by parents. Banerji et al. (2017) examined mother participation in child education, child and mother time use, mother aspirations for her child and perceptions of her child's ability. Dizon-Ross (2017) finds that providing parents with information on child academic performance changes their beliefs and investments on education.

Our intervention entailed both report cards and oral guidelines. Thus, our parent–teacher meetings involved a behavioral or instructional component (e.g., information on how to best help children at home, which could change parental behavior), an informational component (parents learn about their children's performance), and an accountability component for both parents and teachers, as they met and could hold each other accountable for a student's performance. There are many potential benefits of parent–teacher meetings in schools. An increased parental involvement in schools could improve schools' services, potentially improving teachers' accountability and transparency. It is difficult to isolate the effects the relative contribution of each. Although the experiment was not designed to isolate a particular mechanism, we provide some evidence regarding the channels through which test scores and other outcomes are most likely to be impacted.

4.4.1. Do teachers' pedagogy and efforts respond to intervention?

The evidence in the previous section shows clearly that the regular parent–teacher monthly meetings led to significant improvements in student achievements on test scores in math, English, and science. It also enhanced the students' general knowledge and reading and writing skills. However, these improvements could be due to increases in teacher efforts as a result of the meetings. The teachers might put in more effort in order to either improve their accountability or meet new demands from parents following the meetings. Since teachers in the treatment and control schools were paid equally, we do not expect any differential change in behavior due to such payments. We also showed (Table 3) that the teachers in treated and untreated schools have similar characteristics. In addition, the treatment and control schools have similar infrastructure and facilities. Thus, the gains in the students' academic achievements are not due to differences in teacher and school characteristics. It should be noted that the intervention did *not* ask the teachers to change anything that they usually did at school for teaching their students (e.g., an increased monitoring of their classroom presence or the performances of the children, changing their teaching styles, etc.). There was also *no* change in the provision of school resources, curriculum, or school inputs (e.g., textbooks). However, we cannot rule out the possibility that the intervention had some effects on teachers' effort. For example, teachers might have increased their efforts to teach the students or made the school environment more friendly or welcoming so that the children were more likely to come to school. We investigate a few possible channels below.

First, we examine the absence of teachers from school. Previous studies have found high rates of teacher absenteeism in many developing countries, including Bangladesh (Chaudhury et al., 2006).[32] In an attempt to understand the effects on teacher absenteeism, field staff members made random visits to all schools on days other than those of the meetings in order to check for teachers' absences. If a teacher could not be found in the school compound for any reason during the random unannounced spot visit, he or she was considered absent on that day. We see some evidence that teacher

[31] One could also argue that the parent–teacher meetings in year 2 were more organized and systematic because more meetings were held.

[32] Chaudhury et al. (2006) found an absence rate of 23.5% among teachers in Bangladeshi primary schools in one of the two random visits to schools, with higher levels of absenteeism in rural areas.

absenteeism was somewhat lower in the treatment schools, but the difference is not statistically significant (Table A11). Each school has an average of five teachers, and we find that, on average, more than two teachers were absent in total during eight unannounced visits to a given school. Thus, a random visit in a given month found an average of approximately 0.3 of five teachers absent, resulting in an absence rate of about 6%. Overall, the teachers' absence rates in both the treatment and control schools were lower than has been suggested by some studies on teacher absences in developing countries (see for example Chaudhury et al., 2006). However, this difference could be due to the frequent visits to these schools (both treatment and control) at other times by field staff members (to conduct meetings at the treatment schools and to administer baseline and follow-up exams, collect information from report cards, and survey both students and teachers at both the treatment and control schools).[33] Thus, the lower absence rate in this study may not be directly comparable with that of Chaudhury et al. (2006). Overall, the point estimates suggest somewhat lower absence rates of teachers in the treatment schools, though the differences are not significant. The mean teacher absence rates were low (6%), and the difference in the numbers of days that teachers were absent between the treatment and control schools is unlikely to be a significant determinant of the improvement in students' test scores.[34]

However, teacher efforts could change in other ways, even if the impact on their absences is not significant. It is possible that teachers changed their pedagogical practices. In order to understand this, we asked the teachers at the end of year 2 of the intervention about their teaching practices in the classroom. About 25% of the teachers in the treatment schools mentioned that they generally relied only on textbooks, as opposed to 51% in the control schools (Table A12). Nearly 70% of the teachers in the treatment schools reported using real-life examples such as relating materials to the outside world, using maps, pictures, diagrams, and charts. On the other hand, only 48% of teachers in the control schools used such materials as their main teaching aids. Thus, we observed treatment school teachers making significantly greater efforts to teach students, in terms of using visual aids and multiple representations of concepts. In order to understand how much of the gain in students' test scores is due to differences in the instruction methods used by teachers in the treatment schools, we control these variables (dummy variables of whether or not a textbook is used as the main teaching tool and whether visual aids are used for teaching) in a regression analysis of test scores. The treatment effects do not change significantly, and the statistical significance remains unchanged.

It is also possible that the teachers paid more attention to their students' grades because they were having meetings with the parents. We wanted to evaluate and observe the teachers' efforts, teaching practices and instruction methods in the classroom directly by observing them in the classroom through independent evaluators. However, that was not possible due to discouragement from teachers and local educational administrations. There were also no independent teaching evaluations conducted by schools or teachers. We were told that such observations or monitoring of teachers might have unintended consequences, as the teachers might feel threatened,[35] and therefore would not cooperate in the implementation of the program.

The intervention might have also changed the behavior of teachers (and parents) such that they were more concerned about the students' attendance at school. We checked student attendance data from class rosters in both years. On average, students were absent on 2.1 days in treatment schools and 1.7 days in control schools (Table A13) during the first month after the intervention (June 2011). In year 1 (2011), the absences declined more in treatment schools than in control schools, suggesting an improvement in children's attendance at the treatment schools. In year 2 (2012), though, we did not see any significant difference in students' attendance. The students' presence varied somewhat across months, with the control schools having slightly lower absence rates than the treatment schools.

Overall, we see changes in teachers' efforts in terms of altering their instruction methods and being more present at school, along with the more frequent presence of students at school. These changes following intervention are not unexpected, given regular parent–teacher interactions through organized meetings. The next sub-section examines changes in parental engagement at home.

4.4.2. How much did parental involvement increase?

Regular information on children's school performances may encourage an increase in parental involvement. The intervention might have motivated parents to provide a supportive home-learning environment, including talking with the child about their learning and providing resources that foster continuous home-to-school communication. Furthermore, we also examined whether any changes in parental engagement persisted after the intervention finished. Table 8 (Panel A) reports parents' evaluations of their children one year after the end of the intervention. We conducted a follow-up survey at the household level in early 2014, more than a year after the intervention ended, which allowed us to also examine whether the treatment effect was sustained after the end of the intervention, making long-lasting differences to children's future

[33] These schools also received letters from local education officers offering to help in conducting the research, especially in running the surveys, meetings (treatment schools only), and students' tests.

[34] In a separate regression, we also examined the correlates of teacher absenteeism, but we did not find any significant predictor of teachers' characteristics for absenteeism, and the interaction terms of the treatment dummy and the teachers' characteristics are all statistically insignificant. We also added the number of days that teachers were absent to regressions on test scores, but the treatment coefficients remained unchanged.

[35] For example, the teachers were concerned about us reporting to the local educational administration about their teaching practices, even though we gave full assurance that any information would be kept confidential and would be used only for research purposes.

Table 8
Evaluations by parents, students, and teachers.

Panel A: Parental self-report in 2014 (follow-up survey)	Treat	Control	T-C	S.E
Father is helping with study at home most of the time	0.114	0.073	0.041***	0.006
Mother is helping with study at home most of the time	0.136	0.106	0.031***	0.007
Others (brother/sister) helping with study at home	0.136	0.091	0.045***	0.007
Have private tutor	0.591	0.516	.0743***	0.012
Whether child fails to progress to next grade	0.036	0.053	–0.017***	0.008
Did the child get a scholarship in the grade 5 PSC exam?	0.080	0.052	0.027	0.043
Child spends more time on household work than study	0.013	0.030	–0.017***	0.004
Child cannot go to school regularly because of work	0.022	0.054	–0.032***	0.005
Child hangs out with naughty boys/girls	0.038	0.047	–0.009	0.006
Private tuition is very important for doing well in exams	0.622	0.722	–0.100***	0.014
Panel B: Students' own evaluations in 2012 (at the end of the intervention)				
Eat breakfast before going to school everyday	0.525	0.475	0.050***	0.010
Want to be a doctor/engineer	0.280	0.202	0.078***	0.009
Number of hours studying at home daily	3.66	3.52	0.14**	0.070
Weekly study at home (in hours)	20.14	19.00	1.14***	0.422
Feel very confident before any exam	0.703	0.593	0.109***	0.034
Behave well with friends	0.907	0.826	0.081***	0.025
Do homework regularly	0.731	0.707	0.025	0.025
Panel C: Teachers' evaluations in 2012 (at the end of the intervention)				
School attendance is good/very good	0.923	0.884	0.040***	0.006
Class performance is good	0.850	0.789	0.062***	0.008
Does homework regularly	0.828	0.769	0.059***	0.009
Happy about character, discipline, and honesty	0.768	0.726	0.042***	0.009

Notes: Panel A includes a sample of 5128 households from both the treatment and control schools that were surveyed in 2014. The sample also includes students from grade 5 in 2011 (year 1) who were in the program in that year only. Panel B includes all grade 3 and grade 5 students in 2012 (year 2) who sat for the end-line test. Panel C includes the opinions of class teachers about each student in grades 3 and 5 (in 2012) individually. The table reports the means and simple differences between the treatment and control groups. The fourth column shows the standard errors of the difference. Statistically significant differences are marked as stars. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

educational aspirations.[36] We randomly surveyed about 60% of the households in both the treatment and control groups.[37] The test scores of the children in the households that were surveyed do not differ from those in the households that were not.

The results presented in Panel A of Table 8 indicate that there was still a greater parental involvement one year after the intervention ended: the fathers, mothers, and older siblings of the children in the treatment schools were more likely to help them with their study. The parents of the children in the treatment schools reported that their children had more private tutors (59% in treatment schools compared to only 51% in control schools) and were less likely to fail to progress to the next grade. These children also spent less time at home doing household chores. The parents in the treatment schools also placed less importance on private tutoring for their children's educational improvement (62% in treatment versus 72% in control), and more emphasis on helping their children at home. There is no evidence that parents were substituting their own time for private tuition. Instead, we observed an increased involvement of families in their children's education. The teachers also did not encourage parents to seek additional tutoring; indeed, they were specifically asked not to give any such instruction. However, it could be that the information provided in the meetings (e.g., the report cards) helped to identify specific deficiencies that the parents felt tutoring could address. There may also have been some parents who were unable to help their children at home, and these parents might have sent their children to tutors as a result of the meetings. The household survey asked parents in the treatment group for their opinion of the parent–teacher meetings in this intervention. Most of the parents in the treatment schools thought that the parent–teacher meetings contributed to the students' learning, and more than 90% believed that they should continue (Table A14).

4.4.3. Student attitudes and behaviors

The parental evaluations are consistent with the students' self-reported evaluations, conducted immediately after the program ended in late 2012. The results are presented in Panel B of Table 8. Children in the treatment schools were more likely to have a proper breakfast before going to school (53%) than those in the control schools (48%). The students in the treatment group were also more ambitious: 28% wanted to be either a doctor or an engineer, while only 20% of children in the control schools expressed the same ambition. The students in the treatment schools also had more positive behaviors toward their classmates and were more likely to do their homework regularly. They spent about 1.1 more hours

[36] We avoided asking the parents these questions during the intervention in order to avoid the potential Hawthorne effect. While this is less of a concern after over a year, we cannot rule out changes in the parents' behaviors completely, as they were invited to the meetings.

[37] We attempted to visit either odd or even-numbered students by their class roll numbers, which are based on their classroom rankings.

per week studying at home, which is more than a quarter of an hour extra per day. Finally, the treatment group students felt more confident before exams; 70% of students in the treatment schools and 59% in the control schools reported feeling confident in sitting for the exam.

4.4.4. Teachers' evaluations about students

We also find that students' evaluations are consistent with those of their teachers. The class teachers in both the treatment and control schools reported on the behavior and performance of each student. They were asked to report several items about each student at the end of the intervention in 2012, including their attendance, class performance and homework, and an overall assessment of the student's character, discipline, and honesty. On the whole, the teachers reported 92% of children in the treatment schools and 88.5% in the control schools to have good attendances, while 85% of children in the treatment schools and 79% in the control schools were reported to have good performances (Panel C, Table 8). The students in the treatment schools also turned in their homework more regularly: 83% of students in the treatment schools and 77% in the control schools, as reported by teachers. When asked to assess each child's overall behavior, discipline, and honesty, the teachers in the treatment schools reported that 77% of children behaved very well, while the number in the control schools was 73%. Overall, the teachers' assessments suggest that the students who were targeted by the program directly developed more positive behaviors and attitudes at school. These results indicate that schools can improve teachers' perceptions and students' cognitive and non-cognitive behaviors through interactions with parents, engaging them directly in their children's education.[38]

A key concern in our results above is that survey participants (parents, students and teachers) in treatment schools might have responded strategically to our questions. For example, parents might have told the enumerators something 'nice' because we like to hear such responses. If parental responses differ because we organized parent-teacher meetings in the treatment area, then our results are subject to bias, known as experimenter demand effects. We deal with this concern by separating the survey from the program. In particular, we surveyed parents almost after a year of the completion of the intervention. We also used a different set of enumerators for the post-intervention household survey. These enumerators were not in charge of conducting patent-teacher meeting or conducting any previous survey in that area. Hence, such experimenter demand effect, if any, is likely to be minimum. In case of teachers, we asked the survey questions after the intervention so the teachers could remember well about students' performance, behavior and attitudes. It is also possible that teachers' responses could also suffer from experimenter demand effects. We conducted the teachers' survey after the intervention. Hence, teachers did not have any incentives to misreport to us. However, to the extent they answer survey questions to 'satisfy' us the results will be biased. The same could be the case for students who were asked about their aspirations, confidence and study habits just after the intervention ended. However, we think students of this age group would answer any survey questions candidly, and their attitudes in survey responses would not differ systematically between treatment and control schools.[39]

4.5. Spillover effects

We also examine the spillover effects among students who were in grade 4 in year 2 and whose parents were not invited to any meetings. These students were in grade 3 in year 1 and were not part of the intervention in any year. However, the intervention might have had effects on the untreated students in the treatment schools through parental social networks, since they meet frequently in their own villages. Similarly, teachers teach in multiple grades, and if a teacher changed her teaching style in a treated grade, she may have done so in a non-treated grade as well, or she may have discussed this change with other teachers in the school.

The results in Table 9 suggest that there were some positive spillover effects. The ITT estimates for the year 2 grade 4 students in the treatment and control schools suggest that the English test scores of students in the treatment schools improved by 0.25 SD. We did not see any other significant differences, except for a 0.35 SD increase in writing scores. The effects on the other subjects were positive but not statistically significant. The overall mean test scores were 0.11 SD higher, but the effect is not statistically significant. This represents a spillover effect size of about 25% of the ITT effects.

4.6. Cost-effectiveness of the intervention

The intervention is remarkably low cost. We paid each teacher only $25 per academic year to conduct the meetings, meaning that the total added cost for teachers to run the program in a school was $125 per academic year. Even when we include the costs of hiring field staff members and organizing meetings with parents, the cost for each school is still less than $300 per academic year. This amounts to about $1.25 per student per academic year for the teacher costs,[40] or $3 for

[38] As grade three students benefit the least in terms test scores, we also exclude them from the sample. We did not find any significant difference between the results reported here using full sample and the results excluding grade three students, except weekly study hour. We find that students study hour increased by 3.4 hours/week (as opposed to 1.14 h) when excluding grade 3 students from the analysis.

[39] For more details on experimenter demand effects, see recent papers by Mummolo and Peterson (2018) and Dhar et al., (2018). These papers suggest experimenter demand effects may not be that much of a concern in many settings.

[40] On average, there are about 50 students in each grade. The total costs include costs for both grades (grades 4 and 5 in year 1, and grades 5 and 3 in year 2), with about 100 students in total each year.

Table 9
Spillover effects (grade 4 students in year 2).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Math	English	Science	Bengali	ALL	GK/IQ	Reading	Writing
Treatment effect	0.0407	0.245**	0.147	0.0694	0.110	0.0708	0.101	0.351*
	(0.0587)	(0.120)	(0.123)	(0.116)	(0.0945)	(0.148)	(0.136)	(0.198)
N	1280	1280	1280	1280	1280	1141	1144	1144
adj. R^2	0.072	0.082	0.111	0.132	0.168	0.062	0.051	0.055

Notes: This table reports spillover effects using Eq. (1), but considers children who were in grade 4 in 2012 at the treatment schools and therefore were not part of the intervention. The tests were conducted at the end of the intervention, at the same time that we conducted those for the grade 5 and grade 3 students (intervention groups). The standard errors are clustered at the school level and are reported in parentheses. The regression includes the child's gender, parental and household characteristics, and teacher and school characteristics. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

the full program costs (including the costs of preparing report cards and hiring field staff to facilitate the meetings).[41] If we consider the estimate in Table 6, the meetings raised the students' overall test scores by 0.38 SD by the end of the program's second year. Thus, the cost per average 0.1 SD increase in test scores per student is $0.66 or $1.58 for the full program over 2 years.[42]

Parent–teacher meetings are routine in schools in many countries, and the Bangladeshi government does officially mandate that school teachers meet regularly with parents. In practice, though, no such meetings happen in public schools, with a few exceptions in select, urban public schools. These meetings could be almost free of cost if the government were to enforce the mandate for them. Thus, this program could be less costly to scale up than other similar programs that have been evaluated. However, note that it is difficult to compare the cost-effectiveness of different educational interventions implemented across a range of countries due to differences in context, reporting about estimated effect sizes, and outcomes of interest. There are also differences in testing instruments, costs and prices, and target populations. On the surface, however, it seems that our intervention is more cost-effective than any of those studied by either Kremer et al., (2013) or Glewwe and Muralidharan (2016). For example, Kremer et al. (2013) studied 15 interventions, with (statistically significant) effect sizes ranging from 0.14 SD to 0.6 SD for each $100 spent in those studies. [43] If we follow the same approach as Kremer et al. (2013), our results indicate that we could obtain more than a few fold increase in test scores for each $100 spent on our program (including administrative and other expenses).[44]

5. Conclusion

The purpose of this study was to examine the effectiveness of a low-cost strategy for improving the behaviors of both education providers (teachers) and recipients (pupils) by holding regular meetings in order to inform parents about the educational progress of their primary school children. A report card was prepared for each child for each meeting as part of the provision of information about a child's academic progress at school, and the parents also engaged in one-on-one consultations with teachers to receive feedback about the performances of their children.

Engaging parents in their children's education, both at home and at school, is a potentially important way of supporting better learning outcomes. This paper presents strong evidence that parental involvement in school activities can have a significant positive effect on the students' learning, even in low-income countries. Overall, the program increased the students' test scores by 0.26 SD by the end of year 1 and 0.38 SD by the end of year 2.[45] The students' reading and writing skills also improved, as along with their general knowledge. We also found the intervention to have effects on the teachers' efforts and pedagogical practices. This paper shows that the full effects of such programs take some time to become visible. In the short term, higher-ability students (those with baseline test scores in the top third) benefited more from the program; but over time, as the meetings progressed, the low-ability students gradually began to benefit too. The treatment effect is stable and robust and is observed regardless of either the education level or experience of the teachers or the socioeconomic backgrounds of the students. The results show that the intervention induced parents and other household members to spend more time at home helping the children study or do homework. The intervention also helped to improve the attitudes, behavior, and confidence of the children. However, these results are based on self-reported survey data, and there could

[41] These estimates do not include the costs associated with administering the tests for the project in the schools because exams are an integral, routinely-conducted part of education, and there will be no need for independent exams once the system of parent–teacher meetings is in place and enforced.

[42] Ignoring the opportunity cost of parents' time in attending the meetings.

[43] The least expensive program evaluated and considered in these studies was the Balsakhi Program in India, where the corresponding cost was $0.67 per 0.1 SD increase in test scores.

[44] This is calculated as the effect size reported in Table 6 multiplied by the number of children under consideration, divided by the total cost of the program in hundreds of dollars.

[45] The estimate for the first year is based on the project specific tests, whereas the estimate for the second year is based on the nationwide competitive exams. The set of questions in these two different exams are however similar as both sets of questions were taken from textbooks. However, there could still be some difference between the two assessments and hence the results for different years are not directly comparable.

be experimenter demand effects. Thus, the results based on survey questions on students, parents and teachers should be interpreted with caution.

Our main conclusion, namely that increased parent–teacher meetings that also provide information about a child's academic progress through a report card can be a cost-effective tool for improving students' outcomes, has important policy implications. Such programs are low-cost and easy to implement, even in disadvantaged communities where parents have low levels of literacy. In the context of developing countries, there is not enough evidence of what a simple one-on-one parent–teacher scheduled meeting can do to improve students' educational achievements. Our results demonstrate that even parents from disadvantaged backgrounds in developing countries can make significant contributions to their children's school performances if they are provided with adequate information and encouraged to become involved.

Parent-teacher meeting is a policy choice that can be put into practice by schools at virtually no additional cost. In fact, according to the education officials in Bangladesh, schools are supposed to hold regular meetings with parents. In practice, such meetings between teachers and parents informing students' academic progress do not take place. Hence, policymakers could consider parent-teacher meeting to improve educational attainment of children in developing countries.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.euroecorev.2018.09.008.

Appendix A. (Tables)

See Tables A1–A14.

Table A1
Attrition by treatment status and grades.

	Grade 4		Grade 5		Grade 3	
	Treat	Control	Treat	Control	Treat	Control
Attrition by midline	0.074	0.046	0.000	0.000		
Attrition by end-line			0.058	0.069	0.116	0.118
Total attrition (number of students)	57		199		472	

Table A2
Baseline raw test score results by attrition in the midline (year 1) and end-line (year 2) tests.

Math	Treat	Control	Diff	*p*-value (diff)
Grade 5 (2012)	6.73	6.81	−0.086	0.856
Grade 3 (2012)	7.41	7.52	−0.112	0.782
Grade 4 (2011)	10.24	9.54	0.701	0.468
English				
Grade 5 (2012)	6.35	6.91	−0.567	0.308
Grade 3 (2012)	7.60	7.33	0.268	0.491
Grade 4 (2011)	8.54	6.69	1.851	0.103
Science				
Grade 5 (2012)	5.75	5.50	0.255	0.429
Grade 3 (2012)	5.60	5.55	0.047	0.847
Grade 4 (2011)	6.93	6.38	0.550	0.297
Bengali				
Grade 5 (2012)	6.01	6.36	−0.354	0.182
Grade 3 (2012)	5.72	5.39	0.336	0.141
Grade 4 (2011)	7.09	6.62	0.472	0.537
GK/IQ				
Grade 5 (2012)	4.38	4.14	0.239	0.463
Grade 3 (2012)	4.49	4.35	0.141	0.558
Grade 4 (2011)	6.89	6.31	0.584	0.322

Notes: The test scores reported in Table A2 are raw test scores rather than standardized. The math, English and GK/IQ tests were marked out of 15, while science and Bengali were marked out of 10. *p*-values of the difference between the treatment and control groups are reported in the last column. None of the coefficients are statistically significant.

Table A3
Correlates of attrition.

	All Students	Grade 3	Grade 5
	(1)	(2)	(3)
Panel A			
Treatment	−0.101	−0.785	0.561
	(0.577)	(0.724)	(0.863)
Baseline Marks	−0.200***	−0.157	−0.192*
	(0.0650)	(0.105)	(0.109)
Student gender (female = 1)	−0.0867	−0.0473	0.144
	(0.0686)	(0.101)	(0.178)
Age of head (above median)	−0.0150	0.190	−0.0161
	(0.0651)	(0.130)	(0.209)
Panel B: Interactions with Treatment Status (treatment = 1)			
Age of head (above median)	0.0286	0.0468	0.00648
	(0.0909)	(0.202)	(0.261)
Household size (above median)	0.0490	−0.270	−0.298
	(0.132)	(0.333)	(0.277)
Student gender (female = 1)	0.0899	0.0513	−0.200
	(0.0979)	(0.165)	(0.226)
Both parents primary educated	0.0866	0.413**	−0.393
	(0.123)	(0.197)	(0.300)
Income above log median	0.0588	−0.198	0.319
	(0.137)	(0.209)	(0.203)
Number of teacher	0.0439	0.154	−0.0186
	(0.0786)	(0.0983)	(0.131)
Years of teaching experience	0.00756	0.00773	0.0105
	(0.00792)	(0.0115)	(0.0134)
Number of classrooms	−0.0458	−0.0762	0.00547
	(0.0689)	(0.101)	(0.110)
School is brick-built	−0.0958	0.124	−0.187
	(0.292)	(0.401)	(0.390)
School has electricity	−0.0733	−0.271	0.385
	(0.186)	(0.171)	(0.340)
Baseline marks (above median)	0.0513	0.110	−0.0994
	(0.127)	(0.162)	(0.234)

Notes: The results use probit regression model for attrition (missing test score) by endline as the dependent variable. The regression also includes parental, teacher and school characteristics. Only the interaction terms of these variables with treatment status are reported above for brevity. Age, household size, education, and income have been converted to binary variables for ease of interpretation of the magnitude of the estimates. Binary variables are equal to one if the corresponding values are above the median. Standard errors are clustered at the school level and are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4
Lee bounds: robustness to attrition.

		Grade 5 (Year 2)				Grade 3 (Year 2)			
		Coef.	s.e	CI low	CI high	Coef.	s.e	CI low	CI high
Math	lower bound	0.374	0.057	0.262	0.487	–0.073	0.062	–0.195	0.050
	upper bound	0.374	0.053	0.271	0.478	–0.073	0.059	–0.189	0.043
English	lower bound	0.322	0.061	0.203	0.441	0.341	0.064	0.216	0.466
	upper bound	0.697	0.056	0.588	0.806	0.346	0.067	0.215	0.478
Science	lower bound	0.284	0.056	0.174	0.393	0.376	0.066	0.247	0.505
	upper bound	0.295	0.050	0.197	0.394	0.378	0.064	0.252	0.504
Bengali	lower bound	0.202	0.050	0.104	0.300	0.047	0.063	–0.077	0.172
	upper bound	0.276	0.046	0.185	0.367	0.050	0.060	–0.067	0.166
ALL	lower bound	0.299	0.048	0.204	0.393	0.171	0.060	0.054	0.288
	upper bound	0.335	0.044	0.248	0.421	0.174	0.059	0.059	0.289
GK/IQ	lower bound	0.254	0.065	0.127	0.381	–0.151	0.073	–0.293	–0.008
	upper bound	0.404	0.067	0.273	0.535	0.065	0.089	–0.108	0.239
Reading	lower bound	0.142	0.070	0.004	0.279	0.081	0.083	–0.082	0.245
	upper bound	0.275	0.069	0.140	0.409	0.088	0.072	–0.054	0.230
Writing	lower bound	0.247	0.066	0.118	0.376	0.226	0.118	–0.005	0.457
	upper bound	0.336	0.075	0.189	0.484	0.246	0.067	0.115	0.376

Table A5
Mean difference in test scores: midline results, year 1.

	Grade 4					Grade 5
ALL	Math	English	Science	Bengali	ALL	PSC Results
Difference	0.2899***	0.3987***	0.1736***	0.3601***	0.3459***	0.1767***
S.E	(0.0392)	(0.0407)	(0.0408)	(0.0397)	(0.0363)	(0.0421)
N			2624			1999
Male						
Difference	0.2905***	0.2543***	0.1458***	0.3667***	0.3596***	0.3132***
S.E	(0.0554)	(0.0566)	(0.0570)	(0.0555)	0.0510)	(0.0553)
N			1371			1106
Female						
Difference	0.2870***	0.3624***	0.1608***	0.3521***	0.3289***	0.0076***
S.E	(0.0546)	(0.0583)	(0.0583)	(0.0568)	0.0514)	(0.0643)
N			1253			893

Notes: This table gives the simple (OLS regression-unadjusted) mean difference in normalized midline (after year 1 of the intervention) test scores between the treatment and control schools, conducted at the end of the academic year. 'ALL' represents the average of the test scores for all subjects (math, English, science, and Bengali). Standard errors are presented in the second row. The test scores are normalized, meaning that the baseline mean and standard deviation of the control group are 0 and 1, respectively. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All of the differences are statistically significant.

Table A6
Mean difference in test scores: end-line, year 2.

	Math	English	Science	Bengali	ALL	GK/IQ	Reading	Writing
Grade 5 studnets: ($N = 2289$)								
Difference	0.423***	0.456***	0.370***	0.336***	0.486***	0.238***	0.217***	0.247***
S.E	(0.0384)	(0.0420)	(0.0381)	(0.0359)	(0.0401)	(0.0419)	(0.0573)	(0.0637)
Male ($N = 1160$)								
Difference	0.403***	0.437***	0.190***	0.384***	0.491***	0.008	0.081	0.241***
S.E	(0.0537)	(0.0595)	(0.0280)	(0.0523)	(0.0576)	(0.0548)	(0.0570)	(0.0604)
Female ($N = 1129$)								
Difference	0.443***	0.475***	0.365***	0.287***	0.480***	0.242***	0.297***	0.237***
S.E	(0.0546)	(0.0590)	(0.0523)	(0.0489)	(0.0558)	(0.0831)	(0.0841)	(0.0725)
Grade 3 students: ($N = 3138$)								
Difference	−0.036	0.335***	0.359***	0.039	0.127***	0.092	0.000	0.308***
S.E	(0.0351)	(0.0365)	(0.0359)	(0.0341)	(0.0287)	(0.0802)	(0.0000)	(0.0838)
Male ($N = 1599$)								
Difference	−0.037	0.294***	0.346***	0.007	0.110***	0.077	0.082	0.728***
S.E	(0.0355)	(0.0521)	(0.0503)	(0.0467)	(0.0405)	(0.1400)	(0.2164)	(0.1662)
Female ($N = 1539$)								
Difference	−0.038	0.376***	0.369***	0.070	0.143***	−0.081	0.169**	0.170**
S.E	(0.0490)	(0.0514)	(0.0511)	(0.0499)	(0.0408)	(0.0825)	(0.0833)	(0.0876)

Notes: This table gives the simple (OLS regression-unadjusted) mean difference in normalized end-line test scores between the treatment and control schools, conducted at the end of the intervention in year 2 (2012). 'ALL' represents the average of the test scores for all subjects (math, English, science, and Bengali). Standard errors are presented in the second row. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The test scores are normalized, so that the baseline mean and standard deviation of the control group are 0 and 1, respectively. Missing test scores at the baseline are imputed using school-administered tests from before the beginning of the intervention.

Table A7
ITT estimates *with controls*: midline results, year 1.

	(1)	(2)	(3)	(4)	(5)	(6)
			Grade 4			Grade 5
Panel A	Math	English	Science	Bengali	ALL	CGPA
Treatment effect	0.305**	0.317**	0.182	0.310***	0.287**	0.220**
	(0.142)	(0.156)	(0.127)	(0.117)	(0.131)	(0.105)
Baseline test score	0.376***	0.355***	0.412***	0.412***	0.585***	0.0916*
	(0.0457)	(0.0580)	(0.0527)	(0.0527)	(0.0595)	(0.0543)
N	1582	1586	1585	1587	1587	1385
adj. R^2	0.196	0.194	0.188	0.080	0.259	0.044
Panel B						
Male	0.306**	0.331**	0.224*	0.325**	0.279**	0.395***
	(0.148)	(0.144)	(0.124)	(0.132)	(0.128)	(0.100)
Female	0.291*	0.296	0.137	0.275**	0.283*	0.0004
	(0.151)	(0.184)	(0.148)	(0.121)	(0.148)	(0.125)

Notes: Panel A of this table reports the OLS regression coefficients using Eq. (2). The control variables include age of the household head, education of the father and mother separately, income of the household, child gender, student-teacher ratio, experience of the head teacher, number of classrooms in schools, whether school is brick built, and whether school has electricity connection. The baseline test scores in the regressions are the pre-intervention test scores for each subject. 'ALL' indicates the mean test score for all subjects (math, English, science, and Bengali). The estimated coefficient of 'treatment' using OLS is given in the first row. For the male and female sub-samples, we report only the coefficient of 'treatment' separately. The test scores are normalized, so that the baseline mean and standard deviation of the control group are 0 and 1, respectively. Standard errors are clustered at the school level and are reported in parentheses. The regression includes child gender, parental and household characteristics, and teacher and school characteristics. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8
ITT estimates *with control*: end-line results, year 2.

Grade 5	(1) Math	(2) English	(3) Science	(4) Bengali	(5) ALL	(6) GK/IQ	(7) Reading	(8) Writing
Treatment effect	0.425***	0.344**	0.343***	0.324***	0.361***	0.294**	0.226	0.184
	(0.158)	(0.159)	(0.129)	(0.114)	(0.125)	(0.144)	(0.146)	(0.143)
Baseline test score	0.189***	0.188***	0.248***	0.152***	0.281***	0.372***	0.199***	0.256**
	(0.0478)	(0.0706)	(0.0500)	(0.0441)	(0.0776)	(0.0798)	(0.0587)	(0.126)
N	1152	1152	1152	1152	1152	1091	1091	1091
adj. R^2	0.103	0.069	0.116	0.082	0.142	0.140	0.098	0.057
Male	0.455**	0.276	0.285*	0.388***	0.346**	0.386***	0.179	0.0905
	(0.200)	(0.182)	(0.143)	(0.139)	(0.146)	(0.137)	(0.158)	(0.135)
Female	0.403***	0.427***	0.398***	0.274**	0.383***	0.198	0.259	0.280
	(0.138)	(0.154)	(0.130)	(0.108)	(0.117)	(0.174)	(0.166)	(0.186)
Grade 3								
Treatment effect	−0.0846	0.348***	0.312***	0.0348	0.165*	0.0270	0.0590	0.313*
	(0.0746)	(0.0903)	(0.107)	(0.101)	(0.0839)	(0.0960)	(0.125)	(0.160)
Baseline test score	0.304***	0.304***	0.299***	0.348***	0.484***	0.387***	0.240***	0.232***
	(0.0336)	(0.0346)	(0.0393)	(0.0364)	(0.0446)	(0.0504)	(0.0461)	(0.0754)
N	1049	1049	1049	1049	1049	896	896	896
adj. R^2	0.167	0.157	0.178	0.187	0.243	0.143	0.077	0.068
Male	−0.0622	0.369***	0.378***	−0.0159	0.176*	0.102	−0.0608	0.439**
	(0.0909)	(0.110)	(0.121)	(0.106)	(0.0913)	(0.115)	(0.142)	(0.170)
Female	−0.0698	0.348***	0.236*	0.0957	0.166	−0.0543	0.175	0.190
	(0.0897)	(0.112)	(0.119)	(0.121)	(0.102)	(0.120)	(0.137)	(0.171)

Notes: This table reports the OLS regression coefficients using Eq. (2). The control variables include age of the household head, education of the father and mother separately, income of the household, child gender, student-teacher ratio, experience of the head teacher, number of classrooms in schools, whether school is brick built, and whether school has electricity connection. The baseline test scores in the regressions are the pre-intervention test scores for each subject. 'ALL' indicates the mean test score for all subjects (math, English, science, and Bengali). The estimated coefficient of 'treatment' using OLS is given in the first row. For the male and female sub-samples, we report only the coefficient of 'treatment' separately. The test scores are normalized, so that the baseline mean and standard deviation of the control group are 0 and 1, respectively. For GK/IQ, reading and writing, the test scores are normalized at the end-line, with a control mean and standard deviation of 0 and 1, respectively. Standard errors are clustered at the school level and reported in parentheses. As no baseline tests for GK/IQ, reading, and writing were conducted, we use the standardized ALL scores as baseline score for these regressions. The regression includes child gender, parental and household characteristics, and teacher and school characteristics. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A9
Numbers of meetings and gains in test scores at the end-line (treatment schools only).

	(1) Math	(2) English	(3) Science	(4) Bengali	(5) ALL	(6) GK/IQ	(7) Reading	(8) Writing
Grade 5	0.102***	0.165***	0.0943***	0.109***	0.130***	0.0452	0.0346	0.100*
	(0.0261)	(0.0375)	(0.0295)	(0.0221)	(0.0268)	(0.0374)	(0.0298)	(0.0513)
Grade 3	0.114***	0.155***	0.154***	0.130***	0.114***	0.0756	0.143***	0.0675
	(0.0259)	(0.0338)	(0.0304)	(0.0413)	(0.0259)	(0.0523)	(0.0280)	(0.0522)

Notes: The sample includes all students from the treatment schools only and employ an OLS regression. Standard errors are clustered at the school level and are reported in parentheses. The regression includes child gender, parental/household characteristics, as well as teacher and school characteristics. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A10
Heterogeneous effects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Math	English	Science	Bengali	All	GK	Reading	Writing
Panel A: Interactions with *household characteristics*								
Treatment school*covariate								
Age of head (above median)	0.333***	0.132	0.162	0.0157	0.146	0.430***	−0.0729	0.140
	(0.125)	(0.134)	(0.132)	(0.112)	(0.111)	(0.152)	(0.145)	(0.180)
Household size (above median)	−0.146	−0.0287	−0.137	0.0763	−0.0373	−0.103	0.171	−0.0224
	(0.157)	(0.171)	(0.139)	(0.145)	(0.127)	(0.155)	(0.216)	(0.183)
Student gender (female = 1)	0.0192	0.0826	0.0678	−0.159	0.0142	−0.145	0.210	0.0907
	(0.143)	(0.121)	(0.0962)	(0.101)	(0.0954)	(0.118)	(0.127)	(0.164)
Both parents primary educated	0.171	0.0337	0.0672	0.156	0.0776	0.364***	0.132	0.0987
	(0.153)	(0.149)	(0.129)	(0.117)	(0.118)	(0.137)	(0.162)	(0.169)
Income above log median	−0.220*	−0.200	−0.138	−0.157	−0.173	−0.154	0.0121	−0.339*
	(0.129)	(0.134)	(0.126)	(0.102)	(0.107)	(0.130)	(0.152)	(0.171)
Panel B: Interactions with *school and teacher characteristics*								
Treatment school*covariate								
Student–teacher ratio	−0.0126	−0.0148	−0.00320	−0.00733	−0.0105	0.00326	0.00636	0.00475
	(0.0102)	(0.0142)	(0.00826)	(0.00726)	(0.00888)	(0.00905)	(0.0135)	(0.0113)
Years of teaching experience	0.0128	0.00972	0.0153	0.00250	0.0104	0.0107	0.00617	0.0270
	(0.0149)	(0.0131)	(0.0109)	(0.0138)	(0.0116)	(0.0158)	(0.0167)	(0.0179)
Number of classrooms	0.121	0.0353	0.0416	−0.00264	0.0590	0.0931	0.249**	−0.0201
	(0.0953)	(0.106)	(0.0986)	(0.0612)	(0.0791)	(0.119)	(0.0956)	(0.127)
School is brick-built	0.387	0.0872	0.125	0.0839	0.177	0.191	−0.214	−0.210
	(0.257)	(0.305)	(0.290)	(0.192)	(0.231)	(0.300)	(0.346)	(0.458)
School has electricity	−0.171	0.00229	−0.00370	0.0433	0.0295	−0.283	0.349	0.0408
	(0.314)	(0.360)	(0.291)	(0.226)	(0.262)	(0.405)	(0.427)	(0.324)

Notes: Age, household size, education, and income have been converted to binary variables for ease of interpretation and the magnitude of the estimates. They are defined if the value is above the median in the overall sample. This table reports the OLS regression coefficients for each subject using Eq. (3). Standard errors are clustered at the school level and reported in parentheses. Sample includes only Grade 5 students who were in the program in both year 1 and year 2. The top panel of the regression also includes child gender and parental and household characteristics, and the bottom panel includes teacher and school characteristics. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A11
Teacher absences in unannounced (random) visits.

	Treatment	Control	Diff (T − C)	S.E
	Teacher absences in 2011 (Year 1)			
April	0.12	0.09	0.03	0.031
May	0.07	0.08	−0.01	0.025
June	0.09	0.05	0.04	0.026
August	0.11	0.20	−0.09***	0.033
Absence in all visits in 2011	0.39	0.42	−0.03	0.065
	Teacher absences in 2012 (Year 2)			
Feb	0.32	0.27	0.05	0.044
March	0.32	0.34	−0.02	0.046
April	0.21	0.23	−0.02	0.040
May	0.23	0.19	0.04	0.040
June	0.17	0.18	−0.01	0.037
July	0.13	0.18	−0.04	0.035
August	0.25	0.24	0.01	0.042
Sept	0.23	0.32	−0.09***	0.043
Oct	0.19	0.33	−0.14***	0.042
Absence in all visits in 2012	2.31	2.56	−0.25	0.146

Notes: The third column shows the difference between the treatment and control schools. The fourth column shows the standard errors of the difference. Statistically significant differences are marked as stars. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A12
Teacher efforts and pedagogical practices.

	Treat	Control	Diff (T – C) [% points]
Teaching practice in classrooms (% of teachers)			
Rely mainly on textbooks	25%	51%	–26%***
Use real-life examples	70%	48%	22%***

Note: Statistically significant differences are marked as stars. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A13
Student absences from classes in year 1 and year 2.

	Treat	Control	Diff (T – C)	S.E
	Student absences in 2011			
June	2.12	1.66	0.46***	0.099
July	1.65	1.68	–0.03	0.077
August	0.77	1.37	–0.60***	0.052
September	0.82	1.35	–0.53***	0.057
	Total number of days absent in these months			
Male	5.22	6.15	–0.93***	0.315
Female	5.51	5.94	–0.43	0.326
	Student absences in 2012			
March	1.37	1.53	−0.163 ***	0.055
April	1.39	1.52	−0.128***	0.058
May	1.20	1.22	−0.027	0.042
June	1.57	1.64	−0.077	0.047
July	2.00	1.74	.258***	0.056
August	0.86	0.73	0.128***	0.029
September	1.80	1.68	.129***	0.044
October	1.49	1.31	.180***	0.037
November	1.59	1.37	.217***	0.037
	Total number of days absent in these months			
Male	13.48	13.02	0.46	0.341
Female	13.01	12.45	0.56**	0.331

Notes: The third column shows the differences between the treatment and control schools. The fourth column shows the standard errors of the difference. Statistically significant differences are marked as stars. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A14
Parents' evaluations of parent–teacher meetings.

Only for treatment schools	% of parents
Do you think that the parent meetings help to improve a child's study?	93.36
Do you think that there should be monthly parent meetings in school?	91.03

Appendix B. (Figures)

See Figures A1A,1B, A2A,2B, A3A,3B A4, A5.

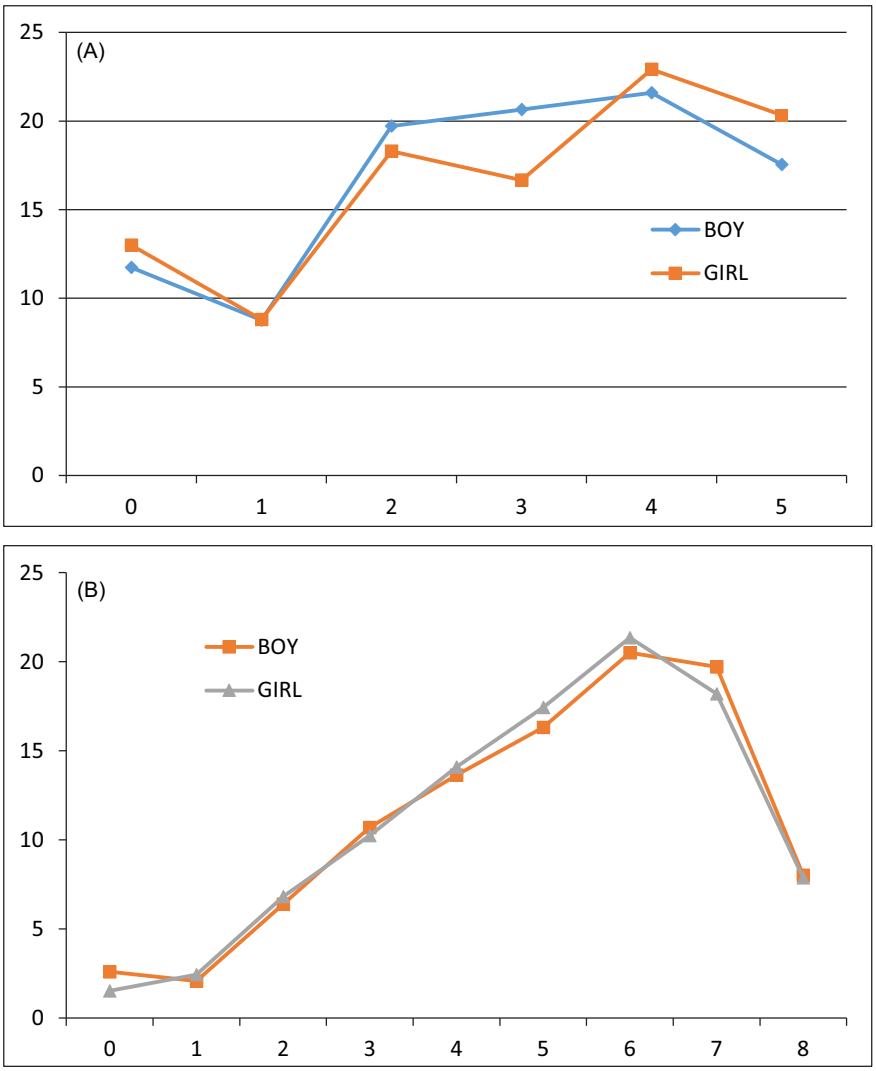


Fig. A1. (A) Numbers of Meetings Attended in Year 1, by Gender of the Children (in %). (B) Numbers of Meetings Attended in Year 2, by Gender of the Children (in %).
Note: Figure shows percentage of parents attended the number of meetings in year 1 (A1A) and year 2 (A1B) of the intervention by the gender of the child.

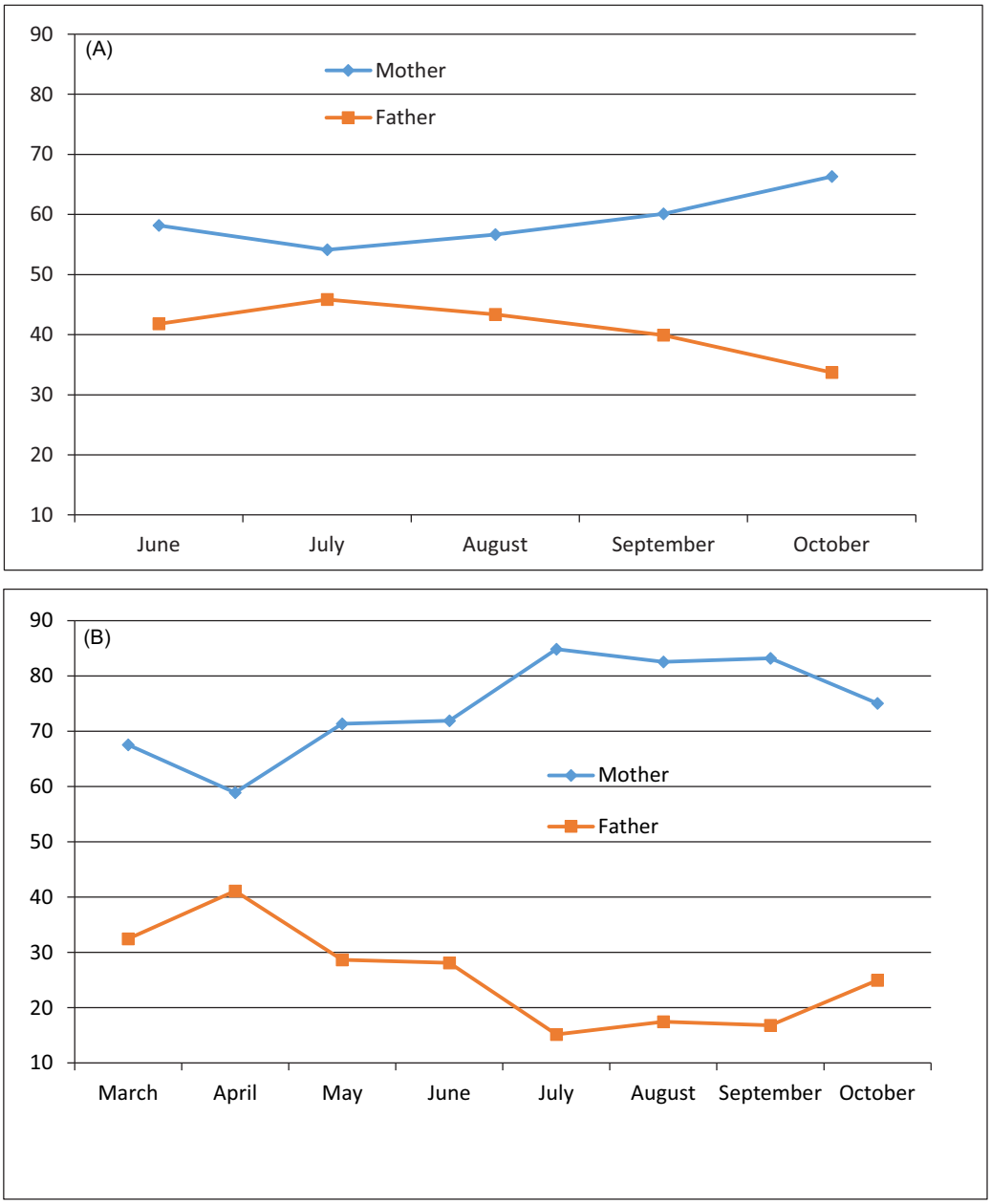
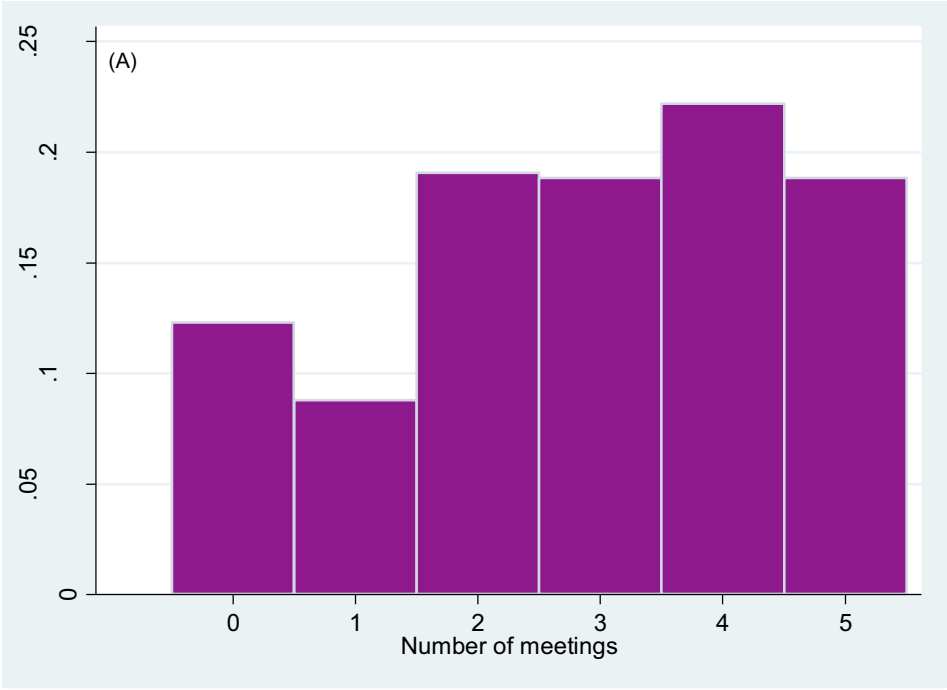


Fig. A2. (A) Attendance at Meetings by Mothers or Fathers (others) in Year 1 (in %). (B) Attendance at Meetings by Mothers or Fathers (others) in Year 2 (in %).
Note: Figure shows percentage of meetings attended by either mother or father among those attended in year 1 (A2A) and year 2 (A2B).



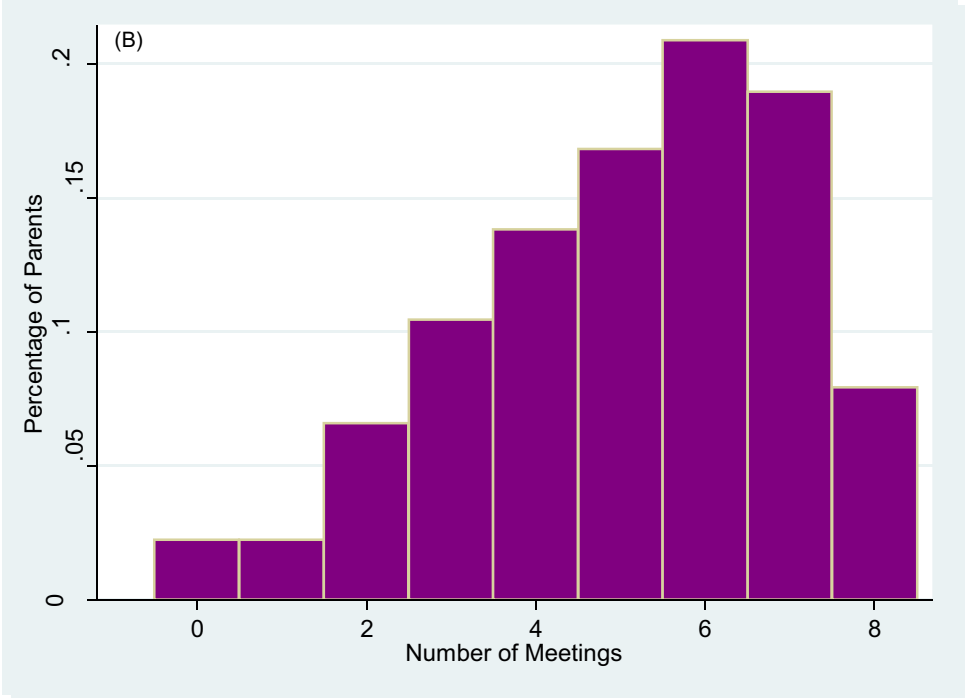


Fig. A3. (A) Numbers of Meetings Attended by Parents in Year 1. (B) Numbers of Meetings Attended by Parents in Year 2.
Note: Figure shows the total number of meetings attended by percentage of parents in year 1 (A3A) and year 2 (A3B) of the intervention.

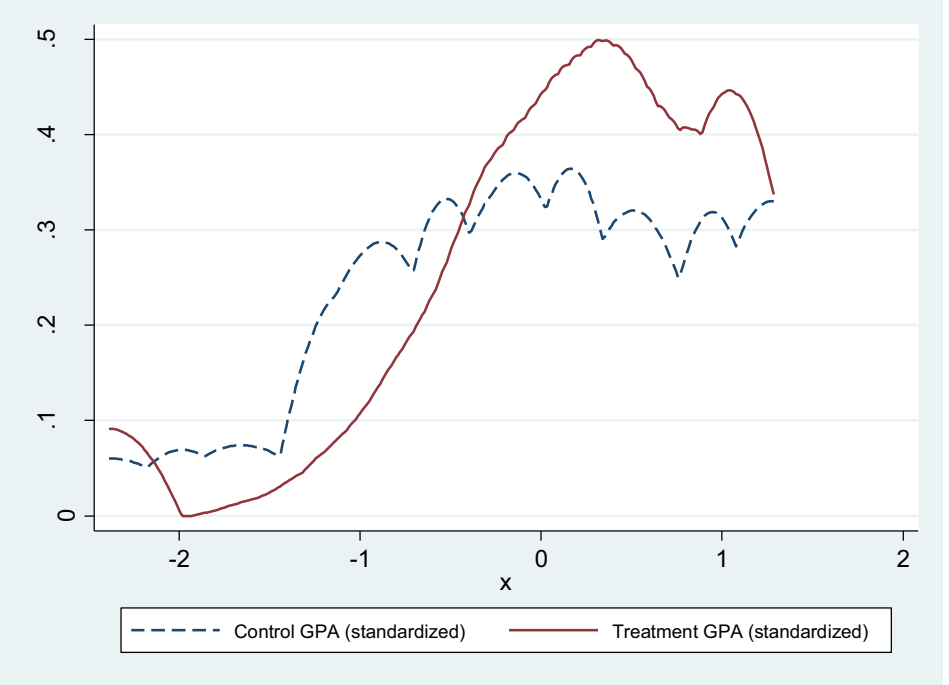


Fig. A4. Distribution of Cumulative GPA Test Scores in Year 1.
Note: Figure shows GPA test scores distribution of treatment and control school children of grade 5 students at the end of year 1 of the intervention.

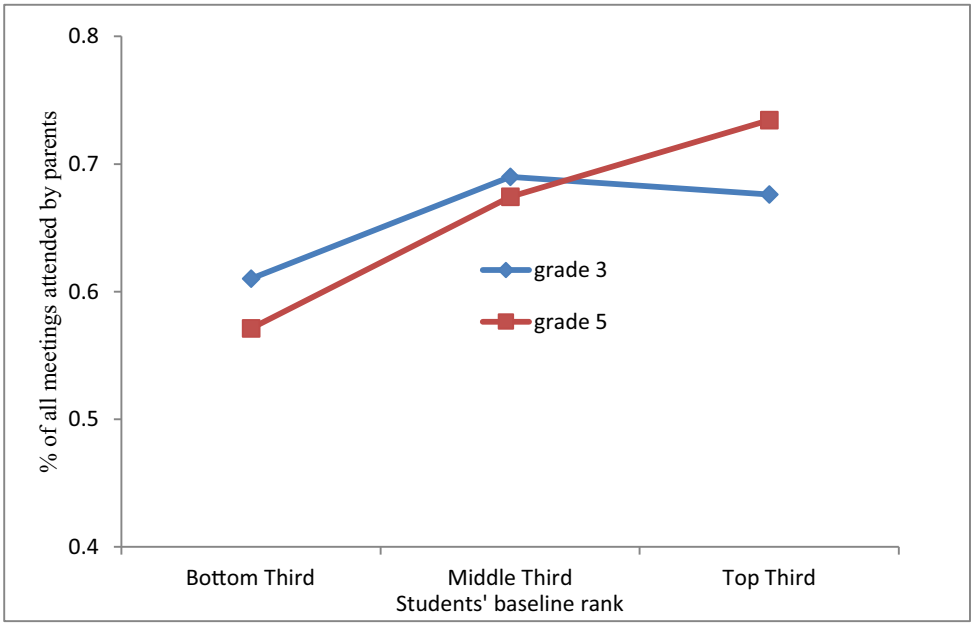


Fig. A5. Parental Presence at Meetings by the Distribution of the Students' Baseline Test Scores.
Note: Figure represents the percentages of meetings that parents attended, based on their children's baseline test score distributions, by a child grade in year 2.

Appendix C. Sample Report Card

School Address:

Village Name	Student Address
School Name	Student Name
Upazila/Thana	Parent's Name
District	Class
Mobile/Telephone	Class Roll

Student's Date of Birth: Day……../Month……/Year…….. Guardian [ ] Father = 1 [ ] Mother = 2

Subject	Code	Baseline Test, 2011	March	April	May	June	July	August	September	October	November
Bangla	1										
English	2										
Mathematics	3										
Science	4										
Social science	5										
General science	6										

Other information:

	March	April	May	June	July	August	September	October	November	Total
Presence of student (days)										
Total working days (days)										
Absent (days)										
Guardian's Presentation (code)*										

*For treatment schools only; this option was not available for report cards in control schools. Code: 1 = Father; 2 = Mother; 3 = Brother/Sister; 4 = Other; 9 = Absent.

Appendix D

Heterogeneous treatment effects

We tested the heterogeneous treatment effects using the following specification:

$$y_{i,post} = \delta_0 + \delta_1 y_{i,base} + \delta_2 treatment_i + \delta_3 treatment_i \times X_i + \delta_4 X_i + \varepsilon_i. \quad (3)$$

This specification tests whether the treatment effect for students with specific characteristics differs from the overall treatment effect; thus, $treatment_i \times X_i$ measures the change in the treatment effect due to characteristicsX_i. We run two separate regressions, one using interactions with only parents' and students' characteristics, and the other using interactions with teachers' characteristics and school resources.[46] We focus on key variables such as parents' age, household size, students' gender, parents' education, and household income. For the teachers' and schools' characteristics, we use the student–teacher ratio, the number of classrooms, teachers' experience, buildings (whether brick-built or not), and whether the school has electricity connections.[47]

The interaction coefficients reported in Panel A of Table A10 suggest that the treatment effect (end-line test scores) for grade 5 students does not vary much by household (log) income, education, or other characteristics. The results in Panel B of Table A10 also indicate that the effects do not vary across schools with different teachers and characteristics. The results for other grades and years are similar, and we do not report here for brevity.

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[46] We report the estimates here by interacting the parental and teacher/school characteristics separately in different regressions. The results using all of these interactions in the same regression are identical.

[47] The continuous variables, such as age, education, etc., have been converted into binary variables for interactions with the treatment indicator, which makes interpretation of the coefficients easier. In particular, we used if a household's head age, education, or household income is above the median in the sample. The median age is 40, household size is 5, and (log) of income is 9.

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