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Mobilizing Parents at Home and at School: An Experiment on Primary Education in Angola*

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Abstract

In this paper we test ways to mobilize parents for education. We implemented a field experiment in 126 Angolan primary schools, including three treatments: an information campaign at home, simple parents' meetings at school, and the combination of both. Our measures of parental mobilization include beneficial practices at home, contacts with teachers, and participation in school institutions. We find that the information increased parents' involvement at home but had no impact on engagement at school, while the meetings had the opposite effects. After mobilizing parents, the combined treatment improved management practices and facilities in schools, teachers' attitudes, and parents' satisfaction.

JEL Codes: C93, D04, D78, I21, O15.

Keywords: Parental involvement, information, coordination, field experiment, Angola.

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1. Introduction

Bottom-up, community-based monitoring is often seen as a feasible alternative to top-down accountability measures in countries characterized by deficient formal institutions and state capacity problems. The underlying assumption is that service recipients are in the best position to monitor service providers and it is in their best interest to do so (World Bank, 2004).[1] In the education sector, this has led to numerous attempts to mobilize parents with the overall objective of improving education outcomes by fostering parental involvement in school governance. To this end, in the last decade many interventions have been implemented in developing countries, typically giving parents information on schools' (or children's) relative performances and/or ways for them to participate in the monitoring of teachers or the education process more generally (e.g., Andrabi et al., 2017; Banerjee et al., 2010; Cerdan-Infantes and Filmer, 2015; Lieberman et al., 2014; Pandey et al., 2011; Reinikka and Svensson, 2004, 2011). The results of these interventions are mixed, with significant impacts observed when parents are able to transfer their children to a different school (Andrabi et al., 2017), are trained to hold reading camps outside of school on a voluntary basis (Banerjee et al., 2010), or receive information about local capture of primary school funds (Reinikka and Svensson, 2004, 2011).[2] While investigations of the impact of information alone tend to document null effects (e.g., Banerjee et al., 2010, Lieberman et al., 2014, Cerdan-Infantes and Filmer, 2015), it is challenging to reach conclusions on the (in)effectiveness of this type of interventions, as the kinds of information and the ways in which information is conveyed differ greatly across studies.[3]

In this paper, we follow and evaluate the implementation of interventions conducted in randomly selected primary schools in Angola with the objective of fostering parental involvement. Our study also relates to the small but growing literature on interventions conducted mainly in developed countries to increase parents' participation in children's education. For instance, Avvisati et al. (2014) held parents' meetings in French middle schools in disadvantaged areas to train parents on ways to help their children perform better at school by being more involved at home. Similarly, Fryer et al. (2015) provided parents in Chicago schools with monetary incentives to attend Parent Academy sessions, while York et al. (2019) conveyed information conducive to better practices at home through text messages.

The interventions we analyze incorporate most of the elements of previous information interventions implemented in developing countries: score cards comparing the performance of the local school relative to other schools in the area, as well as detailed information on the importance of

[1] The possibility of elite capture of bottom-up interventions has however been considered by a large body of literature – see Mansuri and Rao (2013) for a review.

[2] For a recent review of information interventions in education see Read and Atinc (2017) and for a more general review of information interventions aimed at improving service delivery, see Kosec and Wantchekon (2020).

[3] A possible explanation for the mixed results is the different cultural settings under which these programs are taking place and other societal characteristics, such as ethnic fragmentation (Habyarimana et al., 2007; Bjorkman and Svensson, 2010; Alesina and La Ferrara, 2005; and Miguel and Gugerty, 2004) and social and economic inequalities (Sampson et al., 2005), which have been shown to have a negative correlation with individuals' willingness to collectively improve the provision of public services.

participating in children's education both at home and at school.[4] The latter information is conveyed through comics, which is an innovation of our experimental design. The information is distributed in the most intensive way possible, i.e., through repeated household visits. Thus, our methodology is close to that used in early childhood development interventions (e.g., Sylvia et al., 2018). The way information is provided to parents allows us to isolate the impact of information from the possible mediating effects of increased coordination and cooperation among parents that could arise were the information to be disseminated through parents' meetings, as is the case, for instance, in Banerjee et al. (2010), Barr et al. (2012), Pandey et al. (2011), and Pradhan et al. (2014).[5]

Our next step is to ask whether there are simpler, less expensive and more self-sustainable ways to mobilize parents, i.e., not information based, and not requiring extensive baseline data collection. Specifically, in our second treatment, we test whether organizing parents' meetings and facilitating discussions about school related issues raised by parents, without providing any exogenous information, could foster future parental involvement in schools and ultimately improve education outcomes. We are not aware of other mobilization interventions in education relying purely on parents' meetings (absent any kind of external information dissemination) and aimed solely at helping parents cooperate and coordinate their efforts to improve the local provision of education services. Our underlying assumption is that effective parental participation in school accountability systems, e.g., parent committees and school boards, requires coordination among parents and collective action, as shown in Barr et al. (2014). The only study that is similar in scope to ours is by Barr et al. (2012) in Uganda, where the authors find that allowing school committee members, which include parents, decide the items to be measured on a school report card to be later disclosed to parents, yielded positive results on student test scores, as well as teacher and pupil presence at school. Contrary to Barr et al. (2012) our intervention does not rely on the dissemination of report cards (i.e., exogenous information) to parents and therefore does not require the collection of school-level data. Moreover, our meetings and group discussions are targeted exclusively to parents.

By being very different in both nature and implementation, our intensive *Information* intervention (T1) and our *Meetings* intervention (T2) allow investigating what conditions are more likely to impact different forms of parental involvement. First, if cooperation and coordination among parents are important for effective parental participation in formal school accountability institutions, such as parents' committees and school boards, we might see no impact of our Information intervention on such forms of parental involvement, yet there may be an impact on beneficial behaviors that parents can unilaterally change, such as, for instance, the propensity of helping kids with homework. On the other

[4] The only feature we do not incorporate is information about the child's performance in a standardized test relative to other children, as in Lieberman et al. (2014).

[5] A well-known information intervention, conducted in the context of health rather than education services, is the one conducted by Bjorkman and Svensson (2009) in Uganda, which resulted in significant improvements in health outcomes. In their context, the information was conveyed through score cards disseminated during community meetings where participants were also invited to discuss and agree on plans of action, hence the difficulty of attributing the impact of the intervention to information alone.

hand, if effective involvement requires awareness about the importance of certain education inputs and/or outputs – awareness that parents may lack – we might see no impact of the Meetings intervention, where school-related information is endogenously generated and shared.

Finally, we conduct a combination of the *Information* (T1) and *Meetings* (T2) interventions, where we disseminate information through repeated household visits as in T1, and we hold multiple rounds of parents' meetings, as in T2, with the only difference being that the meetings start with the provision of exogenous information (i.e., the same score card used during household visits). This way, our *Combined* intervention (T3) is more intensive than T1 and T2, as the parents' coverage rate per school is weakly greater.[6] This treatment is important, as its comparison with T2 allows examining the topics of discussion of parents who were or were not provided exogenous information, and hence assessing whether in our context providing parents with information about a set of school-specific measures is an important catalyst of both discussions among parents and their future participation in school-level accountability institutions. The comparison with T1 is also meaningful, as it is informative of the value that coordination and cooperation among parents, fostered by the meetings, might add to the impact that intensively disseminated information alone has on parental involvement in their kids' education at home and at school.

We conducted our study in the Angolan province of Kwanza Sul, involving 126 schools randomly selected in groups to receive T1, T2, T3, or act as a control group. To the best of our knowledge, this is the first completed randomized evaluation of a public policy in Angola, a country richly endowed in natural resources but marked by decades of civil conflict (1972-2002) and corruption. Our outcome variables are generated by a comprehensive set of surveys, which included randomly selected parents (about 2,000 at endline), all available teachers (about 1,600 at endline) and all school directors. In addition, we conducted unannounced visits to measure absence of teachers and students, and engaged in direct observation and recording of school administration outcomes, such as the public disclosure of teacher attendance. We also collected behavioral data by engaging randomly selected parents and teachers in incentivized lab-in-the-field experiments, which included a modified dictator game where teachers could send money to groups of parents, and parents could punish under-giving matched teachers by coordinating the resources and efforts of other parents, as parent representatives would do outside the lab. Finally, we conducted standardized tests on all students enrolled in grades 3, 4 and 5, for a total of over 40 thousand observations at the endline.

We hypothesized that our treatments would have a direct effect on various measures of parental involvement in their children's education, and, ultimately, an indirect effect on education outcomes, such as school administration and management, teachers' behaviors, and students' performance in standardized tests. Our first set of results show that all our treatments were effective in mobilizing

[6] It is greater as long as there is no perfect match between the parents visited at home and the parents participating in the meetings.

parents. However, while the Information intervention affected primarily parental involvement at home, the Meetings intervention increased parental participation in formal school accountability institutions, and, as expected, the Combined treatment affected both dimensions of parental involvement. Our estimates are robust and large in magnitude, especially considering that they essentially capture intent to treat effects, given that the parents surveyed at endline were randomly selected, hence not necessarily treated. Our results suggest that meetings and discussions among parents are a necessary component of interventions aimed at fostering participation in school accountability infrastructures, possibly due to the need for parents to develop ties allowing them to overcome collective action problems. Another important result is that holding and facilitating such meetings may be sufficient to foster parental involvement, without the need of providing external information, as (at least some) parents participating in the meetings may be already aware of the prevailing problems in the school and the need to jointly act to address such problems. On the other hand, providing information through household visits may be a more effective way to increase parental involvement at home.

We also examine the indirect impact of the interventions on school outcomes, such as school management and facilities, as well as teacher and student performance. We found evidence of a positive effect of our most intensive treatment, the Combined intervention (T3), on various measures of school management, including indicators of school safety and availability of teaching materials recorded through direct observation. T3 also increased parents' satisfaction with teachers and teachers' behavioral attitudes toward parents as measured by giving in an incentivized dictator game. While we do not see any impact of the treatments on student performance in standardized tests, our analysis of heterogeneous effects suggests that the interventions did improve student performance but only in schools that were performing better at baseline according to the composite index used to generate school-level scores for the report cards used in T1 and T3. This suggests that it may take more time for the other schools to translate improvements in parental participation into management changes and better education outcomes.

The remainder of this paper is organized as follows. Section 2 provides the context of our experiment. Section 3 gives an overview of the treatments, and Section 4 describes the data collection and provides useful comparisons between the three treatments and their implementation. The estimation strategy and hypotheses are discussed in Sections 5 and 6, respectively. Section 7 reports our results, starting with balance tests, following with treatment effects on various measures of parents' mobilization, school management and facilities, teacher and student performance and ending with an analysis of heterogeneous effects. Section 8 concludes.

2. Context

Angola, a country of 29.8 million inhabitants, is the second largest exporter of oil in Sub-Saharan Africa, resulting in a per capita GDP of 6,644 International USDs in 2018, ranking 131st of 189 countries

worldwide.[7] However, Angola suffered a devastating civil war, which lasted three decades, from independence to 2002. Hence, the quality of institutions has been weak, with Transparency International recently rating Angola as the 16th most corrupt country in the world.[8] In this context, health and education indicators have been pushing down Angola's Human Development Index rank to just 147th out of 189 countries worldwide.[9] Angola has a literacy rate of 66 percent and net school enrollment at the primary level of 77.5 percent.[10]

We conducted our study in Kwanza Sul, a province of almost 1.8 million inhabitants and one of the poorest among the 18 provinces of Angola.[11] In a recent report by the National Statistics Office (INE) and UNICEF, based on comprehensive survey data collected in 2016, the headcount of deprivation in education for children 5-11 years of age is 62.9 percent, only higher than in two other provinces of Angola.[12] The World Bank has been active in Kwanza Sul since the 1990s through the funding of FAS (Fundo de Apoio Social), a governmental institution with a countrywide reach. FAS has historically promoted school construction and other infrastructural improvements. More recently, FAS has turned to identifying and implementing strategies aimed at increasing the quality of primary education in Angola. The interventions we study belong to this umbrella of work; they were sponsored by FAS and conducted in 126 primary schools.

3. The field experiment

We conducted a field experiment (RCT) consisting in the implementation of three interventions in randomly selected schools in the Kwanza Sul province. The interventions took place between October 2016 and November 2017, and consisted of an information campaign implemented through door-to-door household visits, the organization and facilitation of parents' meetings, or the combination of the two types of activities.[13]

Within the province of Kwanza Sul, we involved 126 primary schools, distributed across nine municipalities.[14] Most of these schools were either constructed by FAS or received another type of support through FAS. The 126 schools were randomly allocated across the four groups (three treatment groups and one control group) using blocks based on municipality and a set of school characteristics, which included the number of classrooms, number students, number of teachers, and whether there are elections for a parent committee. The geographical allocation to treatment is presented in Figure A2 in the Appendix.

[7] World Development Indicators, 2017.
[8] Transparency International, Corruption Perception Index, 2018.
[9] UNDP, Human Development Reports, 2017.
[10] World Development Indicators, latest years available, 2019.
[11] Preliminary census data, 2014.
[12] INE and UNICEF, 'Childhood in Angola - A Multidimensional Analysis of Child Poverty,' 2018.
[13] See Figure A1 in the Appendix for a complete timeline of all field activities.
[14] Schools are distributed over the municipalities of Sumbe (39), Porto Amboim (37), Amboim (29), Conda (8), Ebo (7), Quilenda (2), Seles (2), Quibala (1) and Cassongue (1).

3.1 The information treatment (T1)

The Information campaign consisted in (repeated) household visits where enumerators showed, explained, and discussed multiple pieces of information with parents. First, parents were shown a score card summarizing their children's school's performance relative to other schools in the same province, using data collected at baseline between October 2014 and October 2015, as explained in Section 4. The score card was divided into several sections, which disclosed: (i) the average performance of students in standardized tests; (ii) different measures of teacher performance (e.g., an indicator about teacher presence, education levels and parent evaluations of teachers); (iii) different measures of school board performance (e.g., management practices, parent and teacher evaluations of the school management); (iv) different measures of parental involvement (e.g., parent participation in meetings); (v) school infrastructures (e.g., availability of toilets, electricity, student desks); and (vi) information about how the teachers and director are evaluated. For each entry, the score card reported the school's indicator in either green or red depending on how the school compared to the province average, green for above average and red for below average. The score card also showed the municipality and province averages for each indicator. See Figures A3a and A3b in the Appendix for an example.[15]

The second component of the information campaign consisted in the distribution and discussion of a comic emphasizing the importance of good parenting practices for the education of children through various vignettes. The comic illustrates the importance of setting clear and consistent rules for children within the household, helping children with homework, assuring safe transport to school, communicating regularly with teachers, and participating in parents' meetings with members of the school administration, as shown in Figure A4 in the Appendix.

Enumerators were instructed to visit as many parents as possible at home, at the local primary school, or at their place of work (often at the farming plots where they operated). The duration of each visit depended on the parents' level of understanding. The information campaign was purposely high intensity in nature, with eight rounds of household visits being conducted, with about one month in between each visit. On average, 74 visits were made per round per school, with a total of 17,989 visits for all T1 schools. Most parents were visited several times. During follow-up visits, parents were questioned informally about their understanding of the information. Depending on their answers, enumerators steered the conversation in order to cover all information as efficiently as possible.

In an attempt to assess the coverage rate of the intervention, i.e., the percentage of parents who were treated, we divide the number of unique household visits by the total number of students per school. This gives us a coverage rate of approximately 60 percent, which is likely to be an underestimate of the actual coverage rate, as it does not account for the fact that some of the students in the schools are siblings.

[15] Table A1 provides English translations of all indicators presented on the score card.

3.2 The Meetings treatment (T2)

In the schools assigned to our Meetings treatment, parents were invited to participate in parent-only meetings via flyers that were sent home through students, as well as distributed door to door. In each school, up to eight meetings, the target number of meetings, were held, i.e., about one meeting per month. On average seven meetings were successfully completed per school. During the first meeting, parents were encouraged to talk about the problems that they perceived to be prevalent in the local school and establish an action plan to attempt to address such problems. Up to seven follow-up meetings were held with the objective of evaluating the progress made and discussing any additional concerns.[16] If needed, the format of the first meeting was repeated.

On average, each meeting lasted about 60 minutes[17] and about 53 parents participated in a meeting per round. We can assess the approximate coverage rate of the intervention in each meeting by dividing the number of participants by the number of students in the school, similarly to what we did for T1. This suggests that an average of about 10 percent of parents participated per round, with the percentage being higher (about 13 percent) for the first meeting.[18]

We recorded the topics discussed in each meeting, which we present in Section 4.4, where we are also able to compare such topics with those discussed in our third treatment, the Combined treatment, which had both an information and a parents' meeting components.

3.3 The Combined treatment (T3)

The Combined treatment blended both the information and meetings components of T1 an T2. Door-to-door visits to parents followed exactly the same procedure as in T1. Enumerators visited an average of 69 households per school for each of the up to eight visit rounds, with a total of 17,058 visits across all schools during the whole intervention, which corresponds to an approximate coverage rate of 60 percent when dividing the number of unique visits by the number of students per school.

Parents' meetings were also carried out following the same procedure as in T2. The only difference is that in the Combined treatment each meeting began with a facilitator showing a poster displaying the school score card and explaining its meaning. On average, 40 parents per school per round participated in the meetings and each meeting lasted about 60 minutes. In Section 4.4 we compare T2 and T3's coverage rates and the topics most frequently discussed by parents.

4. The data

[16] It was not always possible to complete all eight rounds. When a meeting did not happen, for example, because of a funeral or bad weather, the meeting was rescheduled shortly after the original date. When parents did not show up, local leaders would be asked to mobilize the community.

[17] Times of the meetings were not recorded in the first four rounds.

[18] In face of difficulties in recording and processing names of participants in the meetings, we are unable to identify the percentage of parents who participated in more than one meeting.

The baseline data were collected from October 2014 to August 2015, whereas the endline data collection took place between July and December 2018, i.e., eight to 12 months after the implementation of the treatments. In this section, we discuss all data sources and their variations across data collection rounds.[19]

4.1 Surveys, administrative data, and direct observation

First, during the baseline we conducted standardized Mathematics and Portuguese Language tests with all students enrolled in the third and fourth grades.[20] At endline, we also tested fifth grade students. Each test included 10 or 12 questions.[21] All students completed both the Mathematics and the Portuguese tests in class during a one-and-a-half-hour interruption of their normal daily routine. Second, in both data collection rounds we conducted interviews of: parents, teachers, school directors, and school administration employees. At baseline, parents were selected and interviewed using a random walk method around each school. At endline, we first randomly selected 40 students from the third, fourth and fifth grades and then asked their parents to come to school and participate in the survey and lab in the field experiments. Furthermore, all teachers (where possible) and school directors were interviewed in both rounds. The collection of school administration data was implemented by interviewing a group of school representatives, which usually included the school director. We also obtained administrative data from the provincial board of education in Kwanza Sul concerning the school administration and facilities. Finally, besides all other measurements, we collected objective measures of teachers' and students' absence during two visits to the schools at endline.[22]

Our primary outcomes of interest are measures of parents' involvement at home and at school. To this end, the parent survey included questions about parenting practices commonly followed at home such as the establishment of clear daily rules and the tendency to help children with homework, and the engagement with teachers (i.e., the frequency of meetings with the child's teacher) and participatory institutions such as parents' committees. We also obtained measures of parental involvement from the teacher survey, i.e., we ask teachers to assess the extent of parental involvement in the school. Finally, we employ measures of parents' participation in formal school institutions obtained though the school administration survey, i.e., the existence of a parents' committee and the presence of parent representatives in the school board.

Since we expect the interventions to have indirect effects on education outcomes, we also collected measures of school management recorded by enumerators through direct observations. i.e., measures of hygiene and school security, as well as the public disclosure of information about teachers'

[19] See Table A2 in the Appendix for the number of observations per data source.
[20] The tests were modeled after tests that are those routinely employed by the Ministry of Education.
[21] The analysis of student performance at baseline revealed that the baseline tests were too difficult. We therefore modified them at endline. As a consequence, student performance in the test is not directly comparable across time.
[22] During both visits, an enumerator recorded the presence or absence of teachers and of each of the 40 sampled students mentioned above.

qualifications, students' tests, and parents' representation in the school board. We also have various measures of school infrastructures, i.e., number of usable student desks, the numbers of new exercise books, and new chalk boxes found on the school premises. Finally, we devoted attention to measuring teacher performance, i.e., parents' satisfaction with teachers' performance and an objective measure of attendance as recorded by enumerators during two school visits at endline.

Parent, teacher and school director surveys included socioeconomic and demographic questions. School-level control variables from the school administration survey are general characteristics of the school and the students, i.e., number of teachers, number classrooms, and total number of students.

4.2 Lab-in-the-field experiments

We conducted, at the endline, a set of incentivized lab-in-the-field experiments involving about 10 parents and 5 teachers per school.[23] In particular, we implemented a dichotomous Public Good Game, a standard Trust Game, and a modified Dictator Game. The public goods game aimed to measure social cohesion among parents and their willingness to cooperate with each other for the common good. In each school, we planned to play the game with 10 randomly selected parents, and we managed to do so in about 70 percent of the schools.[24] Following Barr et al. (2014), in the game, each parent received a voucher and had to decide whether to invest it in either a private or a group account. Investing the voucher in the private account would generate 600 Kwanzas plus 100 Kwanzas for every voucher invested in the group accounts by other participants.[25] In contrast, investing the voucher in the group account would generate 100 Kwanzas plus 100 Kwanzas for every voucher invested in the group account by fellow participants. We interpret the decision to invest the voucher in the group account as a proxy for a parent's willingness to cooperate with other parents for the common good.

We also implemented a standard trust game with parents and teachers. In the game, parents and teachers were seated in separate rooms and each teacher was matched with a parent; following standard experimental procedures, play and matching was anonymous. Each parent was given 1,000 Kwanzas and had to decide how much money, from zero to a maximum of 800 Kwanzas in multiples of 200, to send to his/her matched teacher. The money was tripled before being passed to the teacher, who then had to decide how much to send back to the parent. Teachers played using the strategy elicitation method, i.e., they stated on a form how much they would send back for each possible amount sent by the parent. Earnings would then be computed by finding out how much the parent sent and

[23] Similar lab-in-the-field experiments were conducted during the baseline. Small differences in design and implementation issues at baseline prevent us from using the baseline data in the analysis of this paper.
[24] We recruited 9 parents in 10 percent of the schools, 8 parents in 11 percent of the schools, 7 parents in 9 percent of the schools, and 6 in 2 percent of the schools.
[25] The game incentives were non trivial for the average participant. Around the start of endline field activities 100 Angolan Kwanzas were equivalent to 0.35 USD. The average reported monthly income of interviewed parents at endline is 28,600 Kwanzas. This is an average income of 1,430 Kwanzas per day, considering 20 working days per month.

implementing the teacher's decision corresponding to that received amount.[26] The main purpose of this game is to measure both parents' trust in teachers and teacher's reciprocity toward parents.

Finally, we designed and conducted a Dictator Game involving parents and teachers. In the game, each teacher is matched with five parents seating in a different room. Play and matching is, once again, anonymous. In the basic version of the game, which was conducted in 42 randomly selected schools, teachers and parents are given endowments of 500 Kwanzas each. Each teacher is given additional 2000 Kwanzas and had to decide how much to send to the five matched parents. The teacher could give nothing or a multiple of 500 (500, 1000, 1500, 2000). The amount sent, if any, would then be equally divided among parents. This game aims to measure teachers' intrinsic motivations toward parents (and/or their children).

In another randomly selected subset of schools, also composed of 42 schools, we conducted a modified Dictator Game, where parents could jointly punish a teacher if they perceived him or her to be under-giving. In particular, each parent was asked to act as a parent representative and decide how much each other parent (and themselves) should contribute to a punishment fund that would be used to impose a penalty on the teacher.[27] One of the five parents would then be randomly selected to be the parent representative and his or her decisions would be implemented to determine final earnings in the game. We designed this variant of the dictator game with the general objective of quantifying parents' willingness to coordinate other parents' efforts and resources to hold teachers accountable, as it happens in well-functioning parents' committees.[28]

4.3 Descriptive statistics and balance tests

Table 1 reports balance tests for school and parent characteristics at baseline. Table 2 reports balance tests for teacher and school director characteristics at baseline. For each measure, we display the mean of the control group, differences to the mean of each of the treatments, the standard errors of such differences, and the p-value of a joint test of equality across all treatments. We also report p-values generated by tests of equality of the means of each pair of treatments.

<Table 1 around here>

Table 1 provides evidence of a fairly balanced sample, which is to be expected given the block randomization we used to assign schools to treatment groups. The average control school has 16

[26] Whether and to what extent the strategy elicitation affects observed behavior is the subject of an ongoing debate. While the evidence is mixed and the complexity of the experiment seems to be a crucial factor (Brandts and Charness, 2000), a survey of the experimental literature (Brandts and Charness, 2011) found no cases of treatment effects generated when using the strategy method and not observed when employing the direct-response method.

[27] In this modified dictator game parents were each given additional 200 Kwanzas, which they could use to punish teachers.

[28] The lab in the field experiments were conducted in the second school visits during the endline. In the first visit (day) invitations were sent out to randomly selected parents to come to school one week later to participate in a workshop. Participants received 400 Kwanzas just for showing up at the workshop, plus additional money that they accumulated in the game. Only one of the games was selected for payments, and the outcomes of each game was revealed to participants in private only at the end of the workshop. Each workshop lasted between 2 and 3 hours.

teachers, 10 classrooms, and 639 students. The only school-level difference we observe in the data is in the size of the T2 and T3 schools, with T3 schools being slightly smaller in terms of number of classrooms and number of students. The last row of the top panel of Table 1 shows descriptive statistics and balance tests for the "school score," i.e., a z-score generated by aggregating the baseline values of all the school indicators used to create the score cards used in T1 and T3.[29] We do not see any significant differences in school performance or quality, as measured by the school scores, across treatment groups. This is important especially for the validity and comparability of our T1 and T3 treatments since they both relied on the dissemination of information about school score cards.

Parent characteristics are also generally balanced across groups, as shown in the bottom panel of Table 1. About 64 percent of the interviewed parents are female, with an average age of 36. About 60 percent of parents completed primary education. The sampled students corresponding to these households are female in 53 percent of the cases and have 11 years of age on average.

While at baseline we did not collect all the measures of parental involvement that we have at endline and that constitute our primary outcomes of interest, in Table A3 in Appendix we report balance tests for the variables that we do have. We do not see any significant differences in self-reported measures of parental involvement at home, e.g., how often they help students with homework, or at school, e.g., the frequency of meetings with teachers as reported by both parents and teachers. We also do not see baseline differences in the existence of formal participatory institutions, such as parents' committees, as reported by teachers, and parents' representation in school boards, which seems to be very low across the board, with about 6 percent of schools having parent representatives to the school board at baseline. We also do not see significant differences across treatments in parents' levels of satisfaction with school director, teachers and school performance.

<Table 2 around here>

The top and the bottom panels of Table 2 report no significant differences in teacher and school director characteristics across control and treatment groups, and between treatments. Teachers are 50 percent female and have 36 years of age on average. About 33 percent of the teachers have higher education degrees. School directors are primarily men and 45 years of age on average. Above 41 percent of school directors have completed higher education.

Overall, we can conclude that our randomization procedure was effective in allocating comparable schools (and parents) to control and treatment groups.[30]

[29] The school performance variable is constructed using all score card indicators at baseline value. First, we standardized each indicator into a z-score by subtracting the mean and dividing by the standard error. All z-scores were then combined into a single variable by taking the average. All score card indicators are fully described in Table A1.

[30] For completeness, we also report balance tests for school, parent, teacher and school director characteristics at endline in Tables A4 and A5 in Appendix.

4.4 Treatment comparisons: coverage, participation, and discussed topics

Our Information (T1) and Combined (T3) treatments both relied on household visits where relevant information was shared with and explained to parents. Our Meetings (T2) and Combined (T3) treatments both had a parents' meeting component, where parents contacted via flyers and door-to-door canvassing were invited to participate in meetings held in the school premises. Here we examine possible differences in coverage rates, i.e., the percentages of treated parents in T1 versus T3, as well as in T2 versus T3. We also compare the topics discussed during the parents' meetings held in T2 versus T3.

Figure 1 shows the percentages of parents visited in their homes in T1 and T3 in each of the eight rounds of household visits. These percentages are an approximation of the actual coverage rate and underestimate the real percentages as they are obtained by simply dividing the number of households by the number of students in the local schools, i.e., without discounting for parents of siblings attending the same school. Nevertheless, the left panel of Figure 1 shows a coverage rate of between 10 and 20 percent per round, with no significant differences across treatments. The right panel of Figure 1, shows the percentages of new visits, i.e., the number of parents who were visited for the first time in each round, divided by the total number of students per school. Here we also see no significant differences between T1 and T3. By adding up the percentages of new visits we obtain the total coverage rates, i.e. the percentages of parents who were visited at least once during the intervention period. These amount to around 60 percent for both T1 and T3, confirming the high intensity of our information interventions.

<Figure 1 around here>

Turning to the comparison between T2 and T3, we also see no significant difference in the (approximate) percentages of treated parents. The left panel of Figure 2 shows the percentages of parents (i.e., number of parents divided by total number of students) who participated in each school-level meeting. We see the percentage of participants to be around 13 percent in the first meeting and declining slightly over time, averaging 10 percent over the duration of the intervention for both T2 and T3. For these treatments, we are unable to distinguish between parents who participated only in one meeting and parents who participated in multiple meetings, and we are therefore unable to assess the overall coverage of the intervention. We can nevertheless compare the existing data for T2 and T3 and note that there are no differences in the percentages of participants in each meeting round or in the average duration of each meeting.

<Figure 2 around here>

Finally, we examine the topics discussed in the meetings. We first focus on discussions concerning school accountability (such as talking to teachers and the school director about their performance or requesting improvements from local government officials), the need for more parental involvement,

parents' committees, and parents' contributions to the school. Figure 3 shows the percentages of T2 and T3 schools that discussed each of the above topics per meeting round.[31] In the first meeting, about 20 percent of T2 schools and 15 percent of T3 schools discussed ways of improving school accountability, with the percentages going down over time, with no significant differences between treatments. Parental involvement was discussed in about 30 percent of schools in both treatments, averaging across all rounds, with no significant differences between T2 and T3 schools. We do see a significant difference in the percentages of schools discussing parents' committees in the first parent meeting, possibly due to such percentage being equal to zero in T3 schools. However, the difference dissipates in subsequent meeting rounds. A higher share of schools, i.e., about 50 percent, in both T2 and T3, saw parents discussing the need to collect contributions to improve the school, namely for new doors, locks, hiring security staff, and cleaning materials, with no significant differences between treatments. Discussions of contributions in time and effort included the need to work together to clean the school and improve the existing infrastructures or build new facilities.

<Figure 3 around here>

Other topics frequently discussed in meetings were hygiene and school safety, as shown in Figure 4. We do not see any significant differences in the shares of schools where parents discussed such topics both by meeting round and averaging across all rounds. Overall, the topic comparison suggests that providing parents with information about school performance through the school report card, as in the Combined treatment, did not alter the way parents looked at and discussed school problems and possible solutions to such problems. This makes any difference between the effects of T2 and T3 on our outcomes of interest unlikely to be driven by differences in the topics and strategies discussed by parents, and more likely to be driven by the intensity and coverage of the treatments, which we expect to be higher for the Combined treatment (T3).

<Figure 4 around here>

5. Estimation strategy

The random allocation of the interventions allows us to estimate the treatment effects using simple OLS specifications. Since the surveyed parents were not necessarily treated, the impact of the interventions on parental involvement can be seen as their intent-to-treat effects, using equation 1 below:

$$Y_{ijk} = \beta_0 + \beta_1 \boldsymbol{T}_j + \delta \boldsymbol{X}_{ijk} + \gamma \boldsymbol{Y}_{jk} + \lambda_k + u_{ijk}. \qquad (1)$$

[31] The figure also reports the number of schools where each meeting round was successfully held, as these numbers go down as time progressed for both T2 and T3.

where Y_{ijk} is the outcome variable for parent i in school j in municipality k as measured during the endline data collection. $\boldsymbol{T}_j$ is the vector of three binary treatment indicators, with the control group serving as the omitted group; $\boldsymbol{X}_{ijk}$ is a vector of demographic characteristics; $\boldsymbol{Y}_{jk}$ is a vector of school characteristics, λ_k are municipality fixed effects, and u_{ijk} is the error term. We cluster the standard errors at the level of randomization, i.e., the school level. We employ the same estimation strategy when testing the impact of the interventions on student-level outcomes, i.e., student absence rates and performance in standardized tests, and teacher-level outcomes. When analyzing school-level outcomes, the vector of demographic characteristics is omitted.[32]

Since we have numerous outcomes of interest at the parent-, teacher-, student- and school-level, and multiple measures of the same outcomes, e.g., different survey questions measuring the degree of parental involvement at home and at school, one concern may be that multiple hypothesis testing could lead to a high rate of false positives. Our approach to addressing this concern is twofold. First, instead of estimating equation 1 for each and every outcome measure, we compute and employ standardized indices for groups of similar outcomes. For instance, we have four survey-based proxies of parental involvement at home: helping with homework, keeping a tight discipline, having sit-down meals with all members of the family, and maintaining a regular sleeping schedule on kids. We aggregate the four measures into an "involvement at home" index by first demeaning each measure and dividing it by the standard deviation of the corresponding control group variable (so that all measures are on a comparable scale) and then taking their average, similar to Anderson (2008). We do the same for all sets of variables measuring the same outcome, hence we considerably reduce the number of hypothesis tests to be conducted. All indices are fully described in Tables A6 and A7 in Appendix.[33] Second, we compute and report q-values obtained by correcting the p-values associated to individual hypotheses concerning to each treatment by employing the step-down multiple testing method developed by Romano and Wolf (2005).

6. Hypotheses

We distinguish between four types of treatment effects, namely (i) *direct* treatment effects on parents and *indirect* treatment effects on (ii) school management and facilities, (iii) teacher behavior, and (iv) student performance. For all outcomes, we expect the indirect treatment effects to be weaker and smaller in magnitude than the direct treatment effects. Our hypotheses follow.

[32] We conduct additional analysis by adding block fixed effects to equation 1 and report the findings in Appendix.
[33] The estimation results for the individual outcome measures used to construct the indices are presented in Tables A8 and A9.

Hypothesis 1: *The Information intervention (T1) has a positive impact on parents' involvement at home and at school, and, to a lesser extent, a positive indirect impact on school management, teacher behavior, and student performance in standardized tests.*

Given that our information campaign had a school score card component and a comic component providing awareness about important ways for parents to be involved at home and at school, if information is an important catalyst for parental participation, we expect the intervention to mobilize parents both at home and at school. Note that by implementing the information campaign through repeated household visits we achieve two goals. First, we isolate the impact of information *alone* from any additional effect that may derive from discussions among parents, had the information been disseminated through parents' meetings, as it is usually the case in the existing literature. Second, the intervention is high intensity compared to previous studies, as the information is provided to parents during one to one home visits, and it includes both a report card component and a comic depicting different ways for parents to benefit their children's education at home and at school. Moreover, 60 percent of households were visited at least once, to enhance parents' level of understanding. By doing so, we maximize the likelihood that the information campaign will have a significant effect on parents' behavior. If we end up finding null effects, hence rejecting Hypothesis 1, we could draw some important conclusions on the ineffectiveness of information interventions in mobilizing parents (at least in our context).

Hypothesis 2: *The Meetings intervention (T2) has a positive direct impact on parents' involvement at school and, to a lesser extent, a positive indirect impact on school management, teacher behavior, and student performance in standardized tests.*

The Meetings intervention did not provide any exogenous information to parents and relied on endogenous information-sharing and discussions on strategies to improve school outcomes. The purpose of this intervention was to examine whether an intervention that is simpler, cheaper and more likely to be sustainable could be equally or more effective than a large scale, high intensity information campaign to mobilize parents. Given the collective nature of the intervention, we expect the treatment to impact parents' coordination efforts and their willingness to jointly participate in formal school accountability processes, for example by establishing parent committees (if they do not exist) and/or by electing parent representatives to the school board. Hence, we expect the intervention to primarily affect parental involvement at school.

Hypothesis 3: *The Combined treatment (T3) has a positive direct impact on parent' involvement at home and at school, and, to a lesser extent, a positive indirect impact on school management, teacher behavior, and student performance in standardized tests.*

By relying on the implementation of both an intensive information campaign and repeated parents' meetings, we expect our third treatment to generate the same results as T1 and T2 combined, and hence to have an impact on parental involvement both at home and at school.

When comparing the effects of each treatment to each other, we can formulate Hypotheses 4 and 5 below.

Hypothesis 4: *The Meetings intervention (T2) is more effective than the Information intervention (T1) in mobilizing parents toward school-level participatory activities that require coordination with other parents.*

Hypothesis 5: *The Combined intervention (T3) has a greater indirect impact than T1 and T2 on school, teacher, and student outcomes.*

Hypothesis 4 originates from the empirically founded assumption that participatory accountability requires collective action and that collective action requires coordination among individuals (e.g., Barr et al. 2012; Barr et al., 2014). The Information intervention, by operating on one-to-one basis, does not facilitate coordination among parents. Therefore, even though in T1 information about school quality and the importance of involvement at home and at school is conveyed in a high intensity manner, by lacking a coordination element, we expect T1 to have a lower impact than T2 on parents' involvement in formal participatory institutions such as parents' committees and school boards.

As for Hypothesis 5, it is motivated by the likely higher coverage rate of T3 as compared to T1 and T2 – given that we do not expect to have a perfect overlap between the parents visited at home and the parents participating in meetings –, as well as the expectation that by both providing information about school quality and good parenting practices at home and at school, and facilitating parents' cooperation and coordination through meetings, the likelihood of affecting education outcomes is higher in T3. In Section 4.4 we showed that the parents participating in meetings in T2 versus T3 discussed similar topics and came up with similar solutions. Therefore, any stronger impact of T3 on education outcomes can be attributed to the higher intensity of the treatment and/or the added value of explaining the importance of parental involvement on a one-to-one basis.

7. Results

7.1 Direct effects on parents' mobilization

We start by examining the impact of the interventions on parents' mobilization toward activities that are beneficial to their children's education. We use data from three data sources: parent survey, teacher survey, and school records of parents' participation in formal school-level institutions. From the parents' survey, we have four measures related to parents' involvement at home: 1) helping with children's homework, 2) keeping clear rules at home, 3) having meals together as family, and 4)

maintaining a sleep schedule for children. We also have two measures of individual parent involvement at school: 1) participation in parent-teacher meetings, and 2) regular gathering of information about the child's performance. For both sets of variables, we construct indices of, respectively, "individual involvement at home" and "individual involvement at school" by first demeaning each measure and dividing it by the standard error of the corresponding control school mean, and then averaging all the newly standardized measures (Anderson, 2008).

From the teachers' survey, we construct a similar index that includes the teacher's perception about: parents' involvement in their children's education, parents' availability to help with extracurricular activities of their children, the average number of parents participating in parent-teacher meetings. The fourth item entering the index is a measure of the teacher's satisfaction with the parents' committee.

Our final index is a measure of formal parental involvement in the school and it originates mostly from the school's survey. We consider (and aggregate measures of) whether there are parents' representatives to the school board, whether there is a parents' committee, and the number of committee members. We also include the school average of parents' self-reported participation in general school assemblies.

We estimate equation 1, which includes parent and teacher (demographic) controls, school controls and municipality dummies, as specified in Section 5.[34] The estimates are shown in Table 3. For each coefficient we report clustered standard errors in parenthesis, and q-values obtained by adjusting p-values for multiple hypothesis testing (Romano and Wolf, 2005) in brackets.[35]

<Table 3 around here>

A number of important findings emerge. First, our highly intensive Information campaign (T1) was very successful in mobilizing parents at home. The estimates suggest that it increased individual involvement at home by 0.27 standard deviations and, to a lesser extent, individual involvement at school by 0.14 standard deviations, although the effect of T1 on the latter variable does not withstand the correction of standard errors for multiple hypothesis testing. The Information intervention had a positive impact on parents' mobilization also according to teachers (column 3), although the effect also loses statistical significant when correcting for multiple hypothesis testing. Differently, T1 had no impact on participation in formal accountability institutions, such as parent committees and school boards, as shown in column 4. Our first result follows:

[34] Parent controls are parent gender, whether the parent has completed primary school, whether the parent has a partner, and number of children; they also include the age of the student, his/her gender, grade and relation to respondent. Teacher controls are teacher age, gender, whether the teacher has completed higher education, whether the teacher has a partner, number of children, years of experience and the corresponding class grade. School controls are number of teachers, number of classrooms, and number of students.

[35] Table A10 in Appendix reports (the very similar) estimates obtained when including block fixed effects to the empirical specification.

Result 1: *The Information intervention (T1) had a positive impact on parental involvement at home but no robust effect on parent involvement at school and participation in formal school-level institutions.*

Table 3 provides evidence of different treatment effects of our Meetings intervention (T2). Specifically, the treatment had no impact on parental involvement at home (column 1) and a weak (and not robust) effect on individual involvement at school, both according to parents (column 2), and to teachers (column 3). However, the Meetings intervention had a positive and significant effect on participation in formal accountability institutions, as shown in column 4. The formal participation index sees an increase of 0.69 standard deviations as a consequence of the intervention and it is significant at the five percent level also when adjusting the standard errors for multiple hypothesis testing (*q-value=0.030*). Our main result is summarized below.

Result 2: *The Meetings intervention (T2) had no impact on parent involvement at home and no robust effects on parent individual involvement at school, i.e., on communication with teachers, but it had a strong positive effect on parental participation in formal school-level institutions.*

As expected, the results obtained for our Combined treatment (T3) look like a combination of the results generated by T1 and T2. Like T1, T3 increased parental involvement at home, with no significant differences in the effects generated by these two treatments. Similarly to both T1 and T2, the intervention did not impact parents' individual involvement at school. However, as a result of the intervention, teachers' assessments of parents' involvement at school (column 3) increased by 0.19 standard deviations. Finally, like for our Meetings intervention, T3 had a large, significant and positive impact on parents' participation in formal accountability school institutions, as shown in column 4 of Table 3. Our third result follows.

Result 3: *The Combined intervention increased parents' involvement at home, parents' involvement at school as perceived by teachers, and parents' participation in formal school-level institutions.*

Our results are largely consistent with our hypotheses on the direct impacts of the interventions (Hypotheses 1 to 3), with the exception of the null effects on parents' involvement at school, i.e., the index capturing the relationship with teachers composed from information gathered in the parent survey. It seems that neither providing extensive information to parents nor facilitating discussions among parents managed to increase parents' propensity to have regular meetings and frequent contacts with their children's teachers, as captured by the "at school" index. On the other hand, the information campaign that we implemented in T1 and as part of T3 was successful in increasing involvement at home, and the parents' meetings that we held in T2 and as part of T3, were successful in facilitating

parents' formal involvement in school participatory institutions such as school committees and school boards. The latter finding is in line with our Hypothesis 4, which highlights the importance of fostering cooperation and coordination among parents to effectively mobilize them toward participatory school-level activities and institutions.

Parents' behavior in the modified Dictator Game provides additional insights on how parents' meetings in T2 and T3 changed parents' attitudes toward joint cooperation for the purpose of holding teachers accountable.[36] In the game, teachers had to decide whether to send money to groups of five parents,[37] and each parent had to assume the role of parent representative and decide how much each parent should contribute to a fund used to impose a penalty on teacher, if the parent perceived the amount give to be unsatisfactory. Each parent had to make this decision using the strategy method, i.e., before knowing the amount sent by teacher, the parent had to decide how much he/she would want other parents to contribute to the joint penalty fund for any possible amount given by the teacher. The choice was between individual contributions of zero, 100 or 200 Kwanzas. Individual contributions of 100, meaning a total of 500 Kwanzas in the joint punishment fund, would impose a penalty of 500 to the teacher, whereas individual contributions of 200 would impose a penalty of 1000 to the teacher. Earnings were subsequently determined by: i) looking at how much the teacher gave to parents, ii) randomly selecting one parent to be the representative for the group, and iii) implementing the parent's decision corresponding to the amount sent by the teacher.

This game was implemented in a randomly selected sample of 42 schools, with the schools being balanced across treatments. A total of 402 parents participated in the game, i.e., about 10 parents per school on average. One important design feature to note is that we randomly selected participants in the lab in the field experiment, hence, once again, any impact of the interventions on behavioral outcomes is essentially an intent to treat effect, since the participants in the games may have not been treated. This is in contrast to other studies employing lab in the field experiments (e.g., Barr et al., 2012) to measure outcomes, where the games are played immediately following the intervention(s) and involve direct recipients of such intervention(s).

Figure 5 shows the average contribution to the punishment fund that a parent sets when in the role of parent representative in the event that a teacher gives no money to the parents. We consider this scenario because it simulates the case of parents having to decide what to do when a teacher is clearly underperforming. We see that the Meetings and Combined treatments led to a significant increase in the average amount that parent representatives request other parents (and set for themselves) to contribute to the punishment fund. Specifically, this amount increases from 118 Kwanzas in the control group to 148 Kwanzas in the Meetings treatment group (T2) and 144 Kwanzas in the Combined

[36] Parents also played a dichotomous public goods game with each other, and a standard trust game where each parent played as sender and each teacher played as receiver. See details in Section 4.2. We do not see any evidence of impact of the treatments on parents' behaviors in the public goods game and the trust game.

[37] The teacher could give any amount between zero and 2000 Kwanzas to groups of five parents, and whatever was given would be split equally among the five parents.

treatment group (T3). The differences between control and T2, and control and T3 are both statistically significant according to both non-parametric tests (Mann-Whitney test p-values equal to 0.008 and 0.018 respectively) and parametric tests (two-sided tests of equality of means p-values equal to 0.006 and 0.016 respectively). The average contributions demanded by parent representatives in the Meetings and the Combined treatments are not statistically different from each other. We do not see any difference in the amounts chosen by parent representatives in the Information treatment. Overall, parents' behavior in the modified Dictator Game that we conducted in a subsample of schools, provides suggestive evidence that the meetings component of the T2 and T3 interventions impacted parents' willingness to coordinate other parents' efforts and resources to hold teachers accountable.

7.2 Indirect effects on school management

We now turn to the impacts of the interventions on outcomes that may have been indirectly impacted through the increased mobilization of parents. We start by examining outcome variables aimed to measure school management practices and the quality of school infrastructures. Our data sources are parent, teacher, and school surveys, which include direct observation of different outcomes of interest. Specifically, we look at: 1) satisfaction of parents with the school management; 2) satisfaction of parents, teachers, and the school director with the availability of school facilities and materials; 3) recording of whether eight different types of information are public, including the names of parents' committee members and parent representatives to the school board; 4) direct observation and assessment of a set of indicators of school safety, hygiene, and materials. Specifically, for safety, we recorded the number of classrooms that have been improved, the presence of a guard and fence, and whether the school recently improved its fence/wall. For hygiene, we recorded whether the school has student bathrooms, as well as access to water and cleaning staff. Finally, the school material index employs the percentage of usable student desks, the numbers of new exercise books, and new chalk boxes found on the school premises.

In all regressions we employ the full set of controls and cluster the standard errors at the school level (when employing observations at a lower level). As before, we report standard errors in parentheses and q-values obtained by adjusting the standard errors for multiple hypothesis testing in brackets. The results are shown in Table 4.

<Table 4 around here>

The estimates provide evidence of a consistently positive and significant effect of our Combined intervention on various measures of school management and the quality of school infrastructures. Parents' satisfaction with the school management increases by 0.15 standard deviations. The level of satisfaction of all stakeholders with the school facilities also sees a large and significant increase (by 0.79 standard deviations). The availability of public information at the school level increases, although

the effect loses statistical significance when correcting the standard errors for multiple hypothesis testing. Importantly, the Combined treatment also has a positive and significant impact on facilities and services related to school safety and teaching resources, as measured through direct observation. In particular, the index measuring school safety increased by 0.67 standard deviations and the teaching materials index increased by 0.62 standard deviations.[38] Our findings are summarized below.

Result 4: *The Combined intervention led to significant improvements in school management, as perceived by parents, as well as increased stakeholder satisfaction with school facilities, and better objective school safety infrastructures and teaching materials.*

We do not find any significant effects of the Information intervention and the Meetings intervention alone on our measures of school management and school infrastructures. Given that the Information treatment only impacted parents' involvement at home, the null effect of T1 is not surprising. In contrast, given the large observed impact of T2 on parents' formal participation in school activities, it is somehow surprising that such increased participation did not translate into better management practices and school infrastructures. The null effect and its contrast with the positive effects observed for T3, may be due to a multiplicity of reasons. As we noted in Section 4.4, it is likely that T3, by combining an information campaign and parents' meetings, had a higher coverage rate, i.e., more parents were treated. The higher intensity of this treatment, as compared to T2, may explain the differences in treatment effects observed in Table 4.[39]

7.3 Indirect effects on teacher performance

Table 5 presents the indirect effects of the intervention on various measures of teacher performance. All regressions include the full set of controls like before. We begin by analyzing an objective measure of teacher performance, i.e., teacher's presence during two random school visits at the endline. We do not report a significant impact of any of the interventions on such variable.

<Table 5 around here>

In columns 2 and 3 of Table 5, we examine measures of parents' satisfaction with teachers' performance, school attendance, general motivation, and extent of caring for students (column 2). We employ a similar index for the school director's satisfaction with teachers (column 3). The estimates show similar effects on parents' satisfaction with teachers in the Information and Combined treatments – the magnitude is around 0.16 standard deviations. However, only the effect of T3 survives multiple

[38] Similar results are obtained when including block fixed effects in the specification, as shown in Table A11 in Appendix.
[39] It is also possible that information about relative school performance provided to parents during meetings held on school premises (in T3) may have also reached other school stakeholders (e.g., the school director), inducing such stakeholders to react more favorably to increased parents' demands for better services and infrastructures.

hypothesis testing. We do not see any impact of the treatments on the satisfaction index relating to the school director.

Finally, the last column of Table 5 reports the results obtained for a behavioral measure of teachers' attitudes towards parents/children obtained from the dictator game that a randomly selected subset of teachers (i.e., five teachers) played in 42 randomly selected schools. In the game, each teacher was given an endowment and had the chance to send some of it to five parents seating in a different room, as described in Section 4.2. The dependent variable is the share of the endowment that the teacher decided to give to parents in the game. The baseline share is 0.36. The estimates show that while the Information intervention had no impact on teacher behavior in the dictator game, both the Meetings and the Combined interventions significantly increased the share of the endowment that teachers gave to parents, by 14 and 20 percentage points respectively. This indicates that the treatments positively affected teachers' attitudes toward parents (and possibly their children), which may reflect better one to one relationships and could ultimately result in higher investments in the provision of quality education to students.[40]

In sum, while we do not see any changes in teachers' likelihood to be present at school during unannounced visits, we find evidence of increased parents' satisfaction with teacher performance as a result of the Combined intervention, as well as evidence of improved attitudes of teachers toward parents following both T2 and T3, as measured by the giving behavior of teachers in a dictator game where groups of parents were the recipients.[41] Our fifth result follows.

Result 5: *a) The interventions had no impact on teacher presence at school; b) The Combined intervention increased parents' satisfaction with teacher performance; c) Both the Meetings and the Combined interventions improved teachers' giving attitudes toward parents.*

7.4 Indirect effects on student performance

To complete our analysis of the indirect impacts of our interventions, we estimate the treatment effects on various measures of student performance. We employ four sets of outcome variables. First, we look at parents' satisfaction with their children's education (column 1). Then, we examine the percentage of students repeating a grade within each school, using data provided by the ministry of education (column 2). Subsequently, we present results for student absenteeism (column 3), an outcome variable that is based on our recording of the absence of a randomly selected sample of students at endline during an unannounced school visit. Finally, we examine student performance in standardized

[40] Figure A5 in the Appendix shows the full distribution of teachers' giving in the dictator game across treatments.
[41] Similar results are obtained when including block fixed effects, as shown in Table A12 in Appendix.

Portuguese and Math tests that we administered in all schools to students enrolled in grades 3 and 4.[42] We employ specifications with full controls like in the previous tables.[43]

<Table 6 around here>

We find some evidence of greater parent satisfaction with their children's performance for T1 and T3, with magnitude between 0.15 and 0.16 standard deviation units, as well as some weak evidence of reduced repetition rates for T2. Still, the overall picture emerging from Table 6 is that the interventions did not have a significant impact on student outcomes, as measured by absence rates and performance in standardized tests.[44]

Result 6: *The Information, Meetings and Combined interventions had no significant impact on student absence rates and performance in standardized tests.*

7.5 Heterogeneous effects

In this section, we present an analysis of heterogeneous effects of the treatments on our main outcomes of interest. Given that the Information and the Combined interventions relied on score cards showing indices of school performance relative to other local schools, it is possible that the interventions were more effective in schools that were rated relatively badly, as this could have incentivized parents to be more involved at home and/or at schools. It is also possible that in such schools, parents' discussions during meetings held in the Meetings and the Combined treatments led to more active parental participation, especially in the Combined treatment, where the relative performance of the school was shown to parents at the beginning of each meeting. Alternatively, seeing better than the average school scores may have motivated parents to be more active both at home and at school in order to maintain and further improve the observed positive school indicators.

In Table 7, we present estimates that include the interaction of each treatment with a dummy equal to 1 if the school is a "top-school" at baseline, where the classification is based on all the baseline indicators constituting the school score cards in T1 and T3. We consider top schools those in the top tercile of the classification distribution.[45] All score card indicators are fully described in Table A1.

<Table 7 around here>

[42] In schools offering grade 5, we also administered the tests to grade 5 students. However, since 25 percent of our schools did not offer grade 5, we restrict the analysis to the performance of students in grades 3 and 4.
[43] For the standardized tests, since we have student performance at baseline (even though not for the same students), we also estimate difference-in-difference regressions. The results of these estimations provide similar results to the ones presented in Table 6, i.e., a null impact of the treatments of student performance in the tests.
[44] Similar results are obtained when including block fixed effects in the specification, as shown in Table A13 in Appendix.
[45] When estimating these regressions, we correct the standard errors for multiple hypothesis testing per treatment interaction.

The results obtained for parental involvement at home (column 2) suggest that the impact of the Information campaign on the at home index holds also for schools that are not at the top of the distribution, with no significant differences due to baseline school performance. We obtain a similar result for the impact of the Meetings treatment on formal participation at school (column 4), whereas the impact of the Combined treatment seems to be null in schools that are not at the top of the distribution based on their baseline overall performance.

With respect to student performance in the standardized test scores, we observe a consistent pattern of heterogeneous effects: we find positive impacts but only for better schools at baseline. This holds especially for the performance of grade 4 students. Taken together, these results suggest that while the treatments, and especially T1 and T2, were effective in mobilizing parents no matter the school baseline performance, increased parental involvement was successful in improving student outcomes only in better performing schools at baseline. This indicates that more time may be needed for the observed increase in parental involvement at home or in formal school institutions to translate into improvements in student outcomes in schools that were characterized by lower performance indicators at baseline.

We next test whether parents' education is an important factor in determining the effectiveness of the interventions. It is for instance plausible that more educated parents are more receptive of the interventions and more able to coordinate themselves in an attempt to improve school outcomes. In Table 8 we present estimates generated by interacting each treatment with a dummy equal to 1 for school areas characterized by a high frequency of surveyed parents who did not complete primary education. Specifically, we employ a dummy equal to 1 for the bottom tercile of schools, where the distribution is based on the share of surveyed parents who completed primary education. We find no consistent patterns of heterogeneous treatment effects due to parents' education levels.

<Table 8 around here>

8. Conclusion

In this paper, we examined the effectiveness of different ways to mobilize parents in primary schools in Angola. We contrasted a high intensity information intervention conducted through household visits, with a more self-sustained, intervention aimed at facilitating parents' meetings without providing any exogenous information. The information campaign relied on enumerators explaining to parents their school's report card – comparing numerous school characteristics and outcomes to those of the average school in the district – and comics depicting important ways for parents to participate in their children's education both at home and at school. In contrast, the parents' meetings had the sole purpose of bringing parents together and letting them raise and discuss school-related issues and possible solutions. We also implemented a combination of the two interventions, where we distributed

information through household visits and facilitated parents' meetings, which started with a brief discussion of the school report card.

Our experimental design allowed us to isolate the importance of information alone on parents' involvement at home and at school. This way, we contribute to a large literature showing mixed results of information campaigns on parents' mobilization at school. The existing studies often combine the dissemination of information with other factors (e.g., parents' meetings) that may mediate the impact of information alone on parents' behavior. By estimating the effect of providing different kinds of information to parents on a one to one basis, we can conclude that information alone is effective in improving beneficial parenting practices at home, such as helping children with homework and setting a clear time discipline. However, it has no impact on involvement at school (e.g., contacts with teachers) and participation in formal institutions such as school committees and school boards.

Our Meetings treatment allowed us to test whether facilitating parents' interactions and discussions about endogenously raised school-related problems and solutions, hence indirectly fostering cooperation and coordination among parents, may be a more effective (and cheaper) way to increase parental involvement at school. We found that it is. The Meetings treatment significantly increased parents' participation in formal school-level institutions.

Our Combined treatment led to results that mimic those obtained for the Information (T1) and the Meetings (T2) treatments alone, i.e., it increased both involvement at home (like T1) and formal involvement at school (like T2). Data generated by a specially designed lab in the field experiment provide suggestive evidence of the mechanism behind the effectiveness of the Meetings and Combined treatments. It shows that, as a result of the meetings, parents became more willing to spend resources and coordinate other parents' efforts to hold teachers accountable. Additionally, the comparison of the topics discussed by parents in the Meetings and the Combined treatments reveal that, although parents in T2 were not provided any exogenous information about the school, they ended up talking about the same issues and possible solutions as the parents participating in the T3 meetings. This suggests that either school problems were common knowledge among parents, or that at least some parents participating in the meetings in T2 were aware of the most stringent problems and were able to steer the conversation toward them.

One dimension of parental behavior that was unaffected by all interventions is parents' propensity to meet one on one with teachers and get regular feedback on their child's performance, which is what we called *individual* participation at school. The null effect of T1 suggests that either the information provided to parents through household visits was unable to convey the importance of parent-teacher meetings – even though they appeared both in the comic and in the score card –, or that the costs associated with frequently communicating with teachers still exceed the benefits, as they are perceived by parents. As for the null effects of T2 and T3, they seem to be driven by the fact that when parents met they tended to discuss issues that they could address *together*; hence, the importance of holding individual meetings with teachers never came up.

When testing whether the treatments had any indirect positive effects on other outcomes, such as measures of school management and quality of school infrastructures, we see that (only) the Combined intervention did have effects. We also see that this intervention increased parents' satisfaction with teachers and teachers' giving attitudes toward parents, as measured through a lab-in-the-field Dictator Game. The greater giving of teachers to parents is also seen as a result of the Meetings treatment (but not of the Information intervention), suggesting that the driver of the observed better attitudes of teachers toward parents may be increased parental involvement at school.

Finally, while we do not find evidence of a significant indirect impact of any of the interventions on student performance in standardized tests, our analysis of heterogeneous effect shows that the interventions did increase performance but only in schools that were overall better at baseline suggesting that it may take more time for worse than average schools to see changes in parental involvement (at home or at school) translate into better education outcomes.

Taken together, our results show that effective parental involvement at school could be achieved by facilitating parents' meetings and discussions without the need to collect extensive school data and disseminate it to parents in the form of school report cards. Such meetings have the benefit of increasing parents' willingness to cooperate and coordinate their effort to improve salient school outcomes, and they seem to also result in better attitudes of teachers toward parents. However, combining parents' meetings with high intensity dissemination of information is necessary to see improvements in school management and school facilities in a relatively short time period (8 to 12 months in our case).

Finally, we note that while providing parents with information about both the school and various ways for parents to be involved at home and at school (through household visits) is unlikely to mobilize parents at school, it does seem to improve parental involvement at home, which could result in long term benefits for children, as suggested by the literature on early childhood development. Since our information intervention had both a score card component and a comic component, by design we are unable to scientifically disentangle the role that each component played in successfully mobilizing parents at home. However, given that the parents' behaviors that changed at home were among those mentioned in the comic and did not appear in the score card, we can speculate that the comic was most likely the driving force behind the success of the intervention. This is good news, as comics do not require any data collection prior to their dissemination to parents and can therefore be produced at a much lower cost than school score cards.

References

Alesina, Alberto, and Eliana La Ferrara (2005), *Ethnic diversity and economic performance*. Journal of Economic Literature, 43(3): 762-800.

Anderson, Michael L. (2008), *Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects*, Journal of the American Statistical Association, 103(484):1481– 1495.

Andrabi, Tahir, Jishnu Das, and Asim Ijaz Khwaja (2017), *Report Cards: The Impact of Providing School and Child Test Scores on Educational Markets*, American Economic Review, 107(6): 1535-63.

Avvisati, Francesco, Marc Gurgand, Nina Guyon, and Eric Maurin (2014), *Getting parents involved: A field experiment in deprived schools*, Review of Economic Studies, 81(1): 57-83.

Banerjee, Abhijit V., Rukmini Banerji, Ester Duflo, Rachel Glennerster, and Stuti Khemani (2010), *Pitfalls of Participatory Programs: Evidence from a Randomized Evaluation in Education in India*, American Economic Journal: Economic Policy, 2(1): 1–30.

Barr, Abigail, Frederick Mugisha, Pieter Serneels, and Andrew Zeitlin (2012), *Information and Collective Action in Community-based Monitoring of Schools: Field and Lab Experimental Evidence from Uganda*, Unpublished.

Barr, Abigail, Truman Packard, and Danila Serra (2014), *Participatory accountability and collective action: Experimental evidence from Albania*, European Economic Review, 68: 250-269.

Björkman, Martina, and Jakob Svensson (2009), *Power to the People: Evidence from a Randomized Field Experiment on Community-Based Monitoring in Uganda*, Quarterly Journal of Economics, 124(2): 735-769.

Björkman, Martina, and Jakob Svensson (2010), *When is Community-Based Monitoring Effective? Evidence from a Randomized Experiment in Primary Health in Uganda*, Journal of the European Economic Association, 8(2-3): 571-581.

Brandts, Jordi and Gary Charness (2000), *Hot vs. cold: Sequential experimental games,* Experimental Economics, 2: 227–238.

Brandts, Jordi and Gary Charness (2011), *The strategy versus the direct-response method: A first survey of experimental comparisons.* Experimental Economics, 14(3): 375-398.

Cerdan-Infantes, Pedro, and Deon Filmer (2015), *Information, Knowledge and Behavior: Evaluating Alternative Methods of Delivering School Information to Parents*, World Bank, Policy Research Working Paper 7233.

Fryer, Roland G., Steven D. Levitt, and John A. List (2015), *Parental incentives and early childhood achievement: a field experiment in Chicago heights*, NBER Working Paper No. 21477.

Habyarimana, James, Macartan Humphreys, Daniel N. Posner, and Jeremy M. Weinstein (2007), *Why Does Ethnic Diversity Undermine Public Goods Provision?*, The American Political Science Review, 101(4): 709-725.

Kosec, Katrina, and Leonard Wantchekon (2020), *Can information improve rural governance and service delivery?,* World Development, 125, 104376.

Lieberman, Evan S., Daniel N. Posner, and Lily L. Tsai (2014), *Does Information Lead to More Active Citizenship? Evidence from an Education Intervention in Rural Kenya*, World Development, 60: 69-83.

Mansuri, Ghazala, and Vijayendra Rao (2013), *Localizing Development: Does Participation Work?*, Policy Research Report, World Bank.

Miguel, Edward, and Mary K. Gugerty (2004), *Ethnic diversity, social sanctions, and public goods in Kenya*, Journal of Public Economics, 89: 2325–2368.

Pandey, Priyanka, Sangeeta Goyal, and Venkatesh Sundararaman (2011), *Does Information Improve School Accountability? Results of a Large Randomized Trial*, World Bank, South Asia Human Development Sector, Discussion Paper Series 49.

Pradhan, Menno, Daniel Suryadarma, Amanda Beatty, Maisy Wong, Arya Gaduh, Armida Alisjahbana, and Rima Prama Artha (2014), *Improving Educational Quality through Enhancing Community Participation: Results from a Randomized Field Experiment in Indonesia*, American Economic Journal: Applied Economics, 6(2): 105-26.

Read, Lindsay, and Tamar M. Atinc (2017), *Information for Accountability: Transparency and Citizen Engagement for Improved Service Delivery in Education Systems*, Global Economy and Development Working Paper 99, Washington D.C.: Brookings Institution.

Reinikka, Ritva, and Jakob Svensson (2004), *The Power of Information: Evidence from a Newspaper Campaign to Reduce Capture*, Quarterly Journal of Economics, 119(2): 678-704.

Reinikka, Ritva, and Jakob Svensson (2011), *The Power of Information in Public Services: Evidence from Education in Uganda*, Journal of Public Economics, 95(7–8): 956-966.

Romano, Joseph P. and Michael Wolf (2005), *Stepwise multiple testing as formalized data snooping*, Econometrica, 73(4): 1237–1282.

Sampson, Robert J., Doug McAdam, Heather MacIndoe, and Simón Weffer-Elizondo (2005), *Civil society reconsidered: the durable nature and community structure of collective civic action,* American Journal of Sociology, 111(3): 673-714.

Sylvia, Sean, Nele Warrinnier, Luo Renfu, Ai Yue, Orazio P. Attanasio, Alexis Medina, and Scott Rozelle (2018), *From quantity to quality: Delivering a home-based parenting intervention through China's family planning cadres*, LICOS Discussion Paper No. 402.

World Bank (2004). *World development report 2004: Making Services Work for Poor People*, Washington D.C.: The World Bank.

York, Benjamin N., Susanna Loeb, and Christopher Doss (2019). *One step at a time the effects of an early literacy text-messaging program for parents of preschoolers,* Journal of Human Resources, 54(3): 537-566.

Figure 1: Shares of parents visited in their homes by round

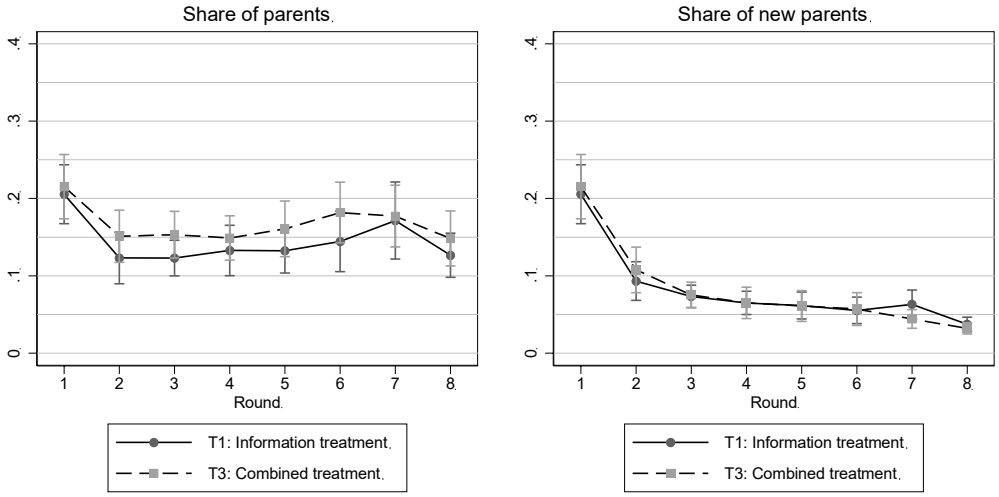


Figure 2: Parents' participation in meetings and meetings' duration

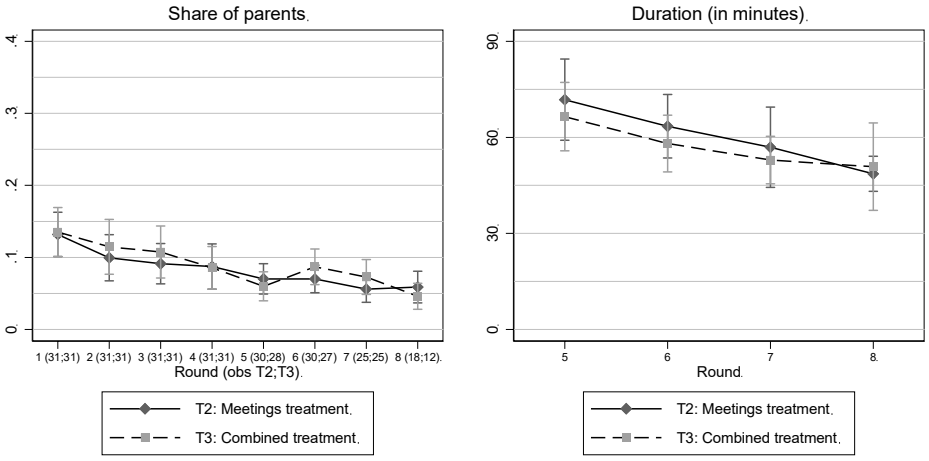


Figure 3: Topics discussed in meetings (percentage of schools)

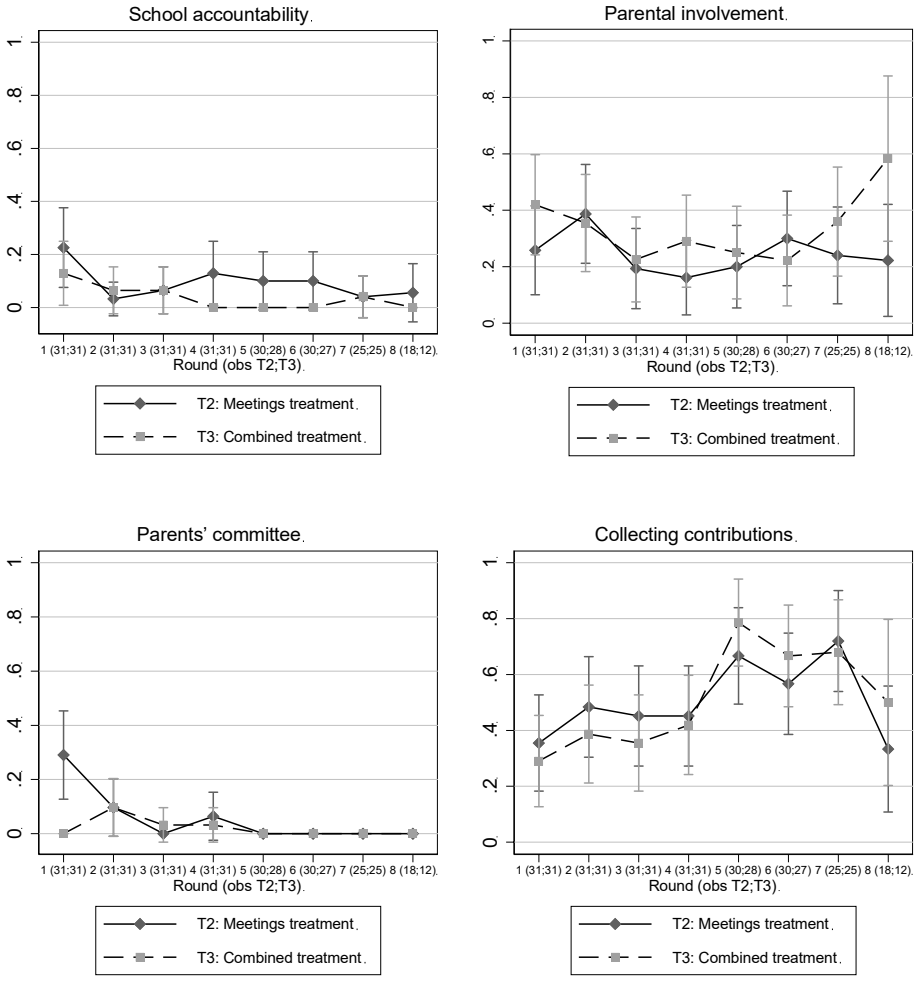


Figure 4: Facility related topics discussed in meetings (percentage of schools)

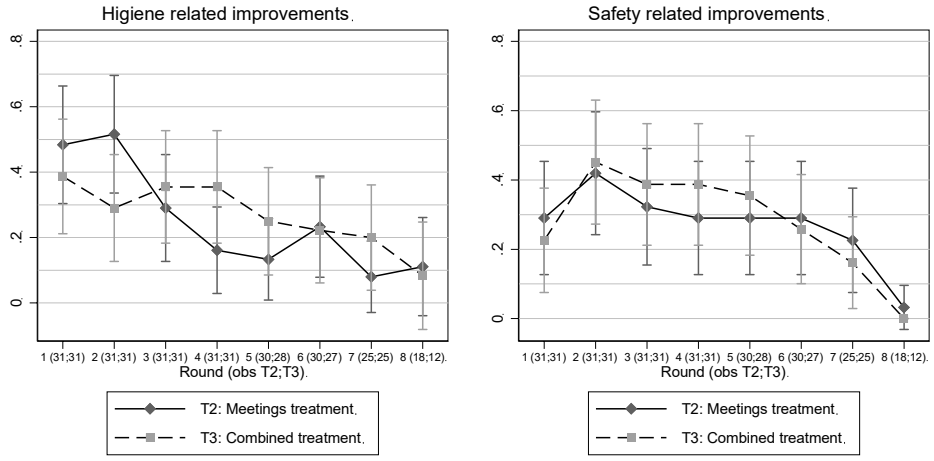


Figure 5: Punishment fund contributions

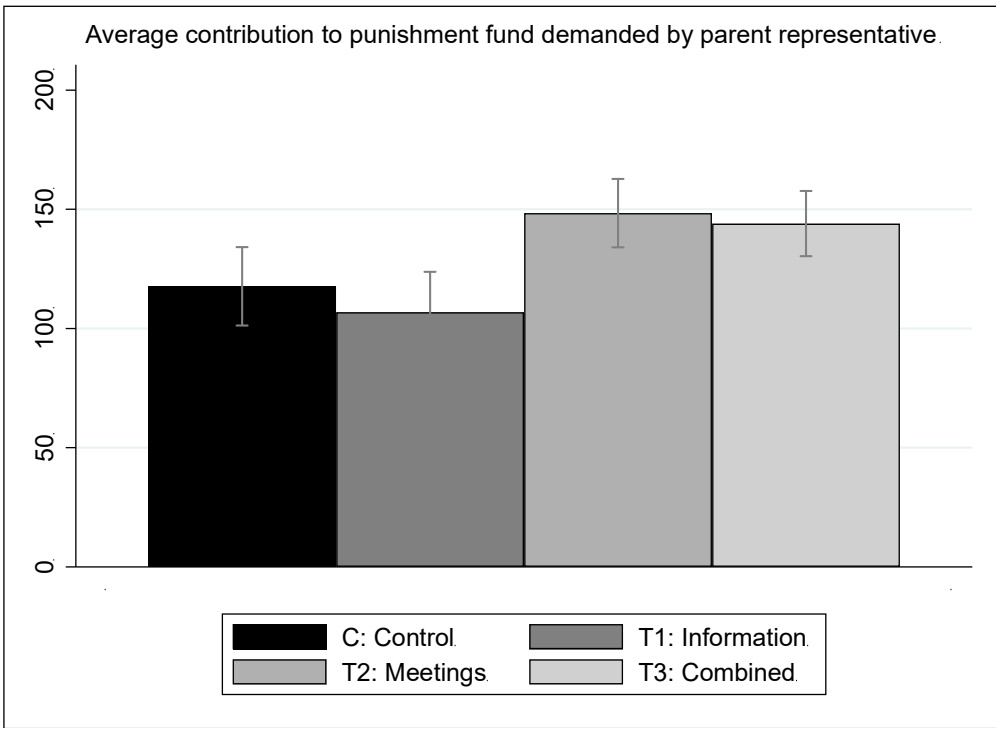


Table 1: Balance tests: School and parent characteristics

School	Control group	T1: Information	T2: Meetings	T3: Combined	Joint F-stat p-value	T1 = T2 (F p-val)	T1 = T3 (F p-val)	T2 = T3 (F p-val)	Observations
Number of teachers	15.969	-0.031	0.580	-3.356	0.440	0.818	0.211	0.142	126
		(2.622)	(2.643)	(2.643)					
Number of classrooms	10.188	-0.781	1.942	-2.021	0.105	0.092	0.445	0.017	125
		(1.591)	(1.604)	(1.618)					
Number of students	638.750	66.156	139.121	-98.653	0.263	0.552	0.181	0.056	126
		(121.430)	(122.406)	(122.406)					
Years since establishment	26.857	-5.624	-5.165	-6.265	0.596	0.929	0.900	0.835	111
		(5.024)	(5.207)	(5.157)					
School offers classes after 6th grade	0.031	0.000	0.066	0.033	0.629	0.263	0.569	0.584	126
		(0.058)	(0.058)	(0.058)					
Distance to municipal capital (in km)	16.188	0.296	2.006	-2.575	0.786	0.704	0.524	0.309	125
		(4.453)	(4.453)	(4.453)					
School in urban area	0.375	0.094	-0.020	0.173	0.392	0.366	0.527	0.128	126
		(0.124)	(0.125)	(0.125)					
School performance	-0.210	0.349	0.184	0.308	0.508	0.516	0.872	0.628	126
		(0.251)	(0.253)	(0.253)					
Parents									
Female	0.640	-0.038	-0.069	-0.043	0.475	0.524	0.922	0.561	2350
		(0.048)	(0.044)	(0.044)					
Age	35.911	1.480	0.550	-0.491	0.369	0.419	0.093	0.391	2350
		(1.224)	(1.268)	(1.282)					
Primary education	0.593	0.057	0.032	0.061	0.689	0.680	0.942	0.627	2350
		(0.057)	(0.056)	(0.057)					
Number of children	4.090	0.209	0.089	0.100	0.842	0.631	0.642	0.959	2350
		(0.232)	(0.218)	(0.199)					
Speak Portuguese at home	0.951	0.011	-0.000	-0.010	0.826	0.591	0.354	0.667	2350
		(0.018)	(0.019)	(0.021)					
Member of local social group	0.089	-0.021	0.033	0.001	0.403	0.093	0.414	0.350	2344
		(0.028)	(0.034)	(0.030)					
Total value assets (in 1000 AKZ)	464.648	9.520	-258.371	-126.077	0.372	0.165	0.568	0.419	1193
		(301.020)	(247.388)	(283.567)					
Student is female	0.527	-0.043	-0.035	-0.044	0.585	0.841	0.962	0.790	2350
		(0.037)	(0.037)	(0.034)					
Student age	10.623	-0.213	0.121	-0.185	0.559	0.237	0.912	0.233	2350
		(0.274)	(0.276)	(0.248)					

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. "School performance" is a z-score constructed out of all scorecard indicators at baseline value. All scorecard indicators are fully described in Table A1.

Table 2: Balance tests: Teacher and school director characteristics

Teachers	Control group	T1: Information	T2: Meetings	T3: Combined	Joint F-stat p-value	T1 = T2 (F p-val)	T1 = T3 (F p-val)	T2 = T3 (F p-val)	Observations
Female	0.500	0.003 (0.078)	0.066 (0.081)	0.017 (0.084)	0.809	0.383	0.851	0.534	731
Age	36.308	0.930 (0.985)	-0.022 (0.990)	-0.342 (0.945)	0.539	0.312	0.156	0.722	730
Higher education	0.330	-0.060 (0.073)	-0.055 (0.071)	0.007 (0.065)	0.627	0.945	0.299	0.320	731
Number of children	3.428	0.329 (0.273)	0.279 (0.307)	0.002 (0.270)	0.488	0.869	0.213	0.350	727
Language spoken at home is Portuguese	0.989	-0.015 (0.013)	0.000 (0.011)	-0.006 (0.012)	0.637	0.240	0.504	0.625	730
Member of local social group	0.166	-0.006 (0.050)	-0.012 (0.051)	0.014 (0.049)	0.963	0.914	0.694	0.619	729
Total value assets (in 1000 AKZ)	851.545	10280.660 (10814.695)	-407.020 (360.766)	11236.223 (11999.395)	0.369	0.325	0.953	0.334	595
Director									
Female	0.156	-0.031 (0.097)	0.005 (0.098)	0.134 (0.098)	0.345	0.711	0.093	0.192	126
Age	44.969	0.451 (1.874)	-0.453 (1.874)	0.465 (1.890)	0.957	0.633	0.994	0.631	124
Higher education	0.406	-0.000 (0.124)	0.165 (0.129)	-0.051 (0.125)	0.377	0.202	0.682	0.097	123
Number of children	4.656	0.156 (0.651)	0.344 (0.656)	-0.449 (0.667)	0.680	0.775	0.366	0.241	124
Speak Portuguese at home	0.875	-0.000 (0.068)	0.093 (0.068)	0.093 (0.068)	0.301	0.176	0.176	1.000	126
Member of local social group	0.281	0.125 (0.118)	-0.023 (0.119)	0.074 (0.119)	0.581	0.216	0.667	0.421	126
Total value assets (in 1000 AKZ)	3874.009	-809.820 (1977.874)	-768.195 (1994.852)	-2443.666 (2052.537)	0.689	0.983	0.428	0.420	115

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level.

Table 3: Treatment effects on parents' mobilization

Dep. variable source --->	Parent survey		Teacher survey	School and parent survey
Dependent variable --->	At home	At school	According to teacher	Formal participation
	(1)	(2)	(3)	(4)
T1: Information	**0.267***** (0.070) *[0.000]*	**0.142*** (0.083) *[0.218]*	**0.167*** (0.092) *[0.218]*	**0.263** (0.271) *[0.347]*
T2: Meetings	**0.084** (0.084) *[0.327]*	**0.177*** (0.092) *[0.178]*	**0.178*** (0.096) *[0.178]*	**0.694**** (0.283) *[0.030]*
T3: Combined	**0.173**** (0.080) *[0.030]*	**0.037** (0.092) *[0.733]*	**0.191**** (0.077) *[0.010]*	**0.579**** (0.249) *[0.030]*
Mean dep. variable (control)	0.000	0.000	0.000	0.000
R-squared	0.074	0.124	0.109	0.141
Observations	1956	1937	1569	126
T1 = T2 (F p-val)	0.039	0.652	0.914	0.100
T1 = T3 (F p-val)	0.236	0.186	0.798	0.174
T2 = T3 (F p-val)	0.347	0.137	0.888	0.654
T1 + T2 = T3 (F p-val)	0.121	0.026	0.247	0.318
Joint F-stat (p-val)	0.002	0.162	0.070	0.038

Note: Estimates based on OLS regressions as specified in section 5. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. P-values adjusted for multiple hypothesis testing grouped by rows are presented in brackets. The regressions include full controls, namely municipality dummies, school controls and for regressions (1) and (2) parent controls and for regression (3) teacher controls. School controls are number of teachers, number of classrooms, and number of students. Parent controls are parent gender, whether the parent has completed primary school, whether the parent has a partner, and number of children; they also include the age of the student, his/her gender, grade and relation to respondent. Teacher controls are teacher age, gender, whether the teacher has completed higher education, whether the teacher has a partner, number of children, years of experience and the corresponding class grade. All dependent variables in this table are indices. The "At home" index includes helping with homework, family meals, clear rules and regular sleeping scedule. The "At school" index includes meeting with teacher and collecting information on child's performance. The "According to teacher" index includes evaluations of the involvement and availability of parents, the number of parents participating in parent-teacher meetings and the opinion about the parents' committee. The "Formal participation" index includes the average parents' attendance of school assemblies, existence of a parents' committee, the number of parents' committee members and whether there is a parents' representative in the school board. All dependent variables are z-score indices and are fully described in Table A6 in Appendix.

Table 4: Treatment effects on school management and school facilities

Dep. variable source --->	Parent survey	All individual surveys	School survey	Facilities observation survey		
Dependent variable --->	**Management satisfaction**	**Facilities satisfaction**	**Public information**	**Safety**	**Hygiene**	**Teaching Materials**
	(1)	**(3)**	**(2)**	**(4)**	**(5)**	**(6)**
T1: Information	**0.097**	**0.033**	**0.027**	**-0.114**	**-0.047**	**-0.145**
	(0.070)	(0.237)	(0.223)	(0.231)	(0.208)	(0.304)
	[0.614]	*[0.980]*	*[0.980]*	*[0.970]*	*[0.970]*	*[0.970]*
T2: Meetings	**-0.091**	**-0.045**	**0.065**	**0.014**	**0.018**	**0.176**
	(0.067)	(0.256)	(0.237)	(0.256)	(0.214)	(0.271)
	[0.554]	*[0.980]*	*[0.980]*	*[0.980]*	*[0.980]*	*[0.950]*
T3: Combined	**0.152****	**0.786*****	**0.480***	**0.671****	**0.322**	**0.623****
	(0.065)	(0.288)	(0.256)	(0.264)	(0.236)	(0.256)
	[0.079]	*[0.050]*	*[0.129]*	*[0.050]*	*[0.158]*	*[0.069]*
Mean dep. variable (control)	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.032	0.238	0.210	0.408	0.248	0.181
Observations	1952	126	126	126	126	126
T1 = T2 (F p-val)	0.010	0.746	0.875	0.642	0.747	0.278
T1 = T3 (F p-val)	0.470	0.007	0.084	0.005	0.115	0.009
T2 = T3 (F p-val)	0.002	0.007	0.129	0.030	0.228	0.096
T1 + T2 = T3 (F p-val)	0.172	0.040	0.268	0.041	0.292	0.151
Joint F-stat (p-val)	0.006	0.024	0.254	0.030	0.432	0.028

Note: Estimates based on OLS regressions as specified in section 5. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. P-values adjusted for multiple hypothesis testing grouped by rows are presented in brackets. The regressions include full controls, namely municipality dummies, school controls and for regression (1) parent controls. School controls are number of teachers, number of classrooms, and number of students. Parent controls are parent gender, whether the parent has completed primary school, whether the parent has a partner, and number of children; they also include the age of the student, his/her gender, grade and relation to respondent. All dependent variables in this table are indices. The "Management satisfaction" index includes responsible behavior of director, preparedness of school staff and a general evaluation of the school. The "Public information" index includes 8 types of information (see Table A6 in Appendix for the details). The "Facilities satisfaction" index includes 9 types of potential facility problems (see Table A6 in Appendix for the details). The "Safety" index includes construction or improvement of classrooms, security staff, fence or wall and construction or improvement of the fence or wall. The "Hygiene" index includes cleaning staff, bathrooms and water access. The "Material" index includes the share of usable chairs, new exercise books and new boxes with chalk. All dependent variables are z-score indices and are fully described in Tables A6 and A7 in Appendix.

Table 5: Treatment effects on teachers' performance

Dep. variable source --->	Observed	Parents survey	Director survey	Behavioral measure
Dependent variable --->	Teacher attendance	Teacher satisfaction index (P)	Teacher satisfaction index (D)	Dictator game: giving decision
	(1)	(2)	(3)	(4)
T1: Information	**0.028**	**0.164****	**0.296**	**0.087**
	(0.042)	(0.081)	(0.263)	(0.065)
	[0.495]	*[0.158]*	*[0.485]*	*[0.485]*
T2: Meetings	**-0.048**	**0.010**	**-0.031**	**0.137****
	(0.046)	(0.074)	(0.295)	(0.063)
	[0.673]	*[0.980]*	*[0.980]*	*[0.079]*
T3: Combined	**0.053**	**0.165****	**0.227**	**0.202*****
	(0.045)	(0.078)	(0.328)	(0.057)
	[0.475]	*[0.079]*	*[0.475]*	*[0.000]*
Mean dep. variable (control)	0.715	0.000	0.000	0.361
R-squared	0.117	0.032	0.146	0.186
Observations	1564	1948	126	169
T1 = T2 (F p-val)	0.080	0.041	0.273	0.345
T1 = T3 (F p-val)	0.557	0.987	0.821	0.037
T2 = T3 (F p-val)	0.045	0.046	0.481	0.268
T1 + T2 = T3 (F p-val)	0.265	0.938	0.929	0.818
Joint F-stat (p-val)	0.200	0.039	0.622	0.006

Note: Estimates based on OLS regressions as specified in section 5. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. P-values adjusted for multiple hypothesis testing grouped by rows are presented in brackets. The regressions include full controls, namely municipality dummies and school controls. Furthermore, regression (1) includes teacher controls, regression (2) includes parent controls, regression (3) includes school director controls and regression (4) includes teacher game controls. School controls are number of teachers, number of classrooms, and number of students. Parent controls are parent gender, whether the parent has completed primary school, whether the parent has a partner, and number of children; they also include the age of the student, his/her gender, grade and relation to respondent. School director controls are director age, gender, whether the director has completed higher education, whether the director has a partner and number of children. Teacher controls are teacher age, gender, whether the teacher has completed higher education, whether the teacher has a partner, number of children, years of experience and the corresponding class grade. Teacher game controls are teacher age, gender, whether the teacher has completed higher education, whether the teacher has a partner, number of children, the number of game participants and the number of familiar game participants. Both "Teacher satisfaction" indices include, a subjective measure of teacher absentism and evaluations of teacher performance and motivation. Additionally the parent survey based index includes performance evaluations specific to the teacher of the parent's child. The dependent variable in column (1) is the average attendance across the two data collection visits. The dependent variables in columns (2) and (3) are z-score indices. The dependent variable in column (4) is the share of the teacher's initial endowment sent to the parents. All dependent variables are fully described in Table A7 in Appendix.

Table 6: Treatment effects on students' performance

Dep. variable source --->	Parent survey	Administrative data	Observed	Standardized tests
Dependent variable --->	Satisfaction student performance	Share of repeaters grades 1-6	Student attendance	Aggregate test score (PT/MAT; grade 3 and 4)
	(1)	(2)	(3)	(4)
T1: Information	**0.162****	**-0.029**	**-0.069**	**0.101**
	(0.068)	(0.025)	(0.064)	(0.096)
	[0.089]	*[0.604]*	*[0.604]*	*[0.604]*
T2: Meetings	**0.071**	**-0.045***	**0.025**	**0.018**
	(0.068)	(0.026)	(0.056)	(0.101)
	[0.594]	*[0.287]*	*[0.842]*	*[0.901]*
T3: Combined	**0.153****	**-0.029**	**-0.007**	**0.111**
	(0.070)	(0.022)	(0.062)	(0.111)
	[0.069]	*[0.495]*	*[0.921]*	*[0.564]*
Mean dep. variable (control)	0.000	0.139	0.593	0.000
R-squared	0.029	0.165	0.042	0.060
Observations	1937	123	4628	43266
T1 = T2 (F p-val)	0.229	0.513	0.117	0.399
T1 = T3 (F p-val)	0.907	0.986	0.328	0.927
T2 = T3 (F p-val)	0.293	0.434	0.591	0.413
T1 + T2 = T3 (F p-val)	0.437	0.168	0.674	0.954
Joint F-stat (p-val)	0.058	0.398	0.469	0.619

Note: Estimates based on OLS regressions as specified in section 5. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. P-values adjusted for multiple hypothesis testing grouped by rows are presented in brackets. The regressions include full controls, namely municipality dummies and school controls. In column (1) we also include parent controls. In column (4) we include grade and test type controls. School controls are number of teachers, number of classrooms, and number of students. Parent controls are parent gender, whether the parent has completed primary school, whether the parent has a partner, and number of children; they also include the age of the student, his/her gender, grade and relation to respondent. The dependent variable in columns (1) and (4) are z-score indices. The dependent variable in column (2) is share of students that repeated a grade. The dependent variable in column (3) is the share of students that were present during the first endline data collection visit. All dependent variables are fully described in Table A7 in Appendix.

Table 7: Heterogeneous effects by baseline school performance (dummy for top tercile)

Dependent variable --->	Parents' mobilization at home		Formal participation by parents		Aggregate test score (PT/MAT; grade 3)		Aggregate test score (PT/MAT; grade 4)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
T1: Information	**0.267***** (0.070)	**0.260***** (0.084)	**0.263** (0.271)	**-0.065** (0.334)	**0.081** (0.100)	**-0.104** (0.107)	**0.110** (0.107)	**-0.135** (0.102)
T2: Meetings	**0.084** (0.084)	**-0.002** (0.079)	**0.694**** (0.283)	**0.712**** (0.304)	**0.010** (0.104)	**-0.126** (0.107)	**0.012** (0.113)	**-0.258***** (0.091)
T3: Combined	**0.173**** (0.080)	**0.117** (0.082)	**0.579**** (0.249)	**0.378** (0.287)	**0.112** (0.122)	**0.066** (0.106)	**0.101** (0.117)	**-0.084** (0.102)
T1 x top performing school		**0.009** (0.165) [0.941]		**0.952** (0.594) [0.198]		**0.431*** (0.223) [0.188]		**0.510**** (0.201) [0.059]
T2 x top performing school		**0.291** (0.202) [0.297]		**0.004** (0.652) [0.297]		**0.490**** (0.203) [0.030]		**0.845***** (0.195) [0.000]
T3 x top performing school		**0.151** (0.183) [0.673]		**0.605** (0.598) [0.644]		**0.150** (0.302) [0.673]		**0.448*** (0.237) [0.188]
Top performing school		**0.064** (0.122)		**-0.384** (0.518)		**-0.149** (0.177)		**-0.219** (0.161)
Mean dep. variable (control)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.074	0.080	0.141	0.177	0.060	0.071	0.070	0.100
Observations	1956	1956	126	126	18933	18933	24333	24333
T1 + T1 x top_perf = 0 (F p-val)		0.054		0.073		0.086		0.026
T2 + T2 x top_perf = 0 (F p-val)		0.134		0.227		0.052		0.001
T3 + T3 x top_perf = 0 (F p-val)		0.101		0.062		0.440		0.089

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. The dummy for the top performing schools is based on the "School performance" variable. "School performance" is a z-score constructed out of all scorecard indicators at baseline value. All scorecard indicators are fully described in Table A1. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. The regressions include full controls, namely municipality dummies, school controls, parent controls for regressions (1) - (4), grade and test type controls for regressions (5) - (8). See the notes of Tables 3 and 6 for the definition of controls and outcome variables employed.

Table 8: Heterogeneous effects by baseline education level (dummy for bottom tercile)

Dependent variable --->	Parents' mobilization at home		Formal participation by parents		Aggregate test score (PT/MAT; grade 3)		Aggregate test score (PT/MAT; grade 4)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
T1: Information	**0.267*** **	**0.244*** **	**0.263**	**0.322**	**0.081**	**0.085**	**0.110**	**0.111**
	(0.070)	(0.082)	(0.271)	(0.342)	(0.100)	(0.107)	(0.107)	(0.119)
T2: Meetings	**0.084**	**0.172**	**0.694** **	**0.606**	**0.010**	**0.102**	**0.012**	**0.108**
	(0.084)	(0.111)	(0.283)	(0.403)	(0.104)	(0.098)	(0.113)	(0.124)
T3: Combined	**0.173** **	**0.245** **	**0.579** **	**0.505**	**0.112**	**0.116**	**0.101**	**0.140**
	(0.080)	(0.100)	(0.249)	(0.306)	(0.122)	(0.127)	(0.117)	(0.127)
T1 x low educated		**0.093**		**-0.250**		**0.211**		**0.105**
		(0.153)		(0.493)		(0.179)		(0.227)
		[0.901]		[0.901]		[0.624]		[0.901]
T2 x low educated		**-0.211**		**0.293**		**-0.048**		**-0.214**
		(0.150)		(0.536)		(0.180)		(0.207)
		[0.426]		[0.812]		[0.812]		[0.624]
T3 x low educated		**-0.232**		**0.211**		**-0.078**		**-0.297**
		(0.157)		(0.575)		(0.209)		(0.265)
		[0.446]		[0.931]		[0.931]		[0.584]
Low educated		**-0.069**		**-0.224**		**-0.454*** **		**-0.191**
		(0.107)		(0.417)		(0.108)		(0.173)
Mean dep. variable (control)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.074	0.081	0.141	0.155	0.060	0.078	0.070	0.082
Observations	1956	1956	126	126	18933	18933	24333	24333
T1 + T1 x low_edu = 0 (F p-val)		0.010		0.847		0.044		0.269
T2 + T2 x low_edu = 0 (F p-val)		0.700		0.016		0.727		0.536
T3 + T3 x low_edu = 0 (F p-val)		0.914		0.133		0.816		0.498

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. The dummy for schools in low educated communities is based on the average number of parents that completed primary education at baseline. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. The regressions include full controls, namely municipality dummies, school controls, parent controls for regressions (1) - (4), grade and test type controls for regressions (5) - (8). See the notes of Tables 3 and 6 for the definition of controls and outcome variables employed.

ONLINE APPENDIX TO:

"Mobilizing Parents at Home and at School: An Experiment on Primary Education in Angola"

Figure A1: Timeline of field work activities

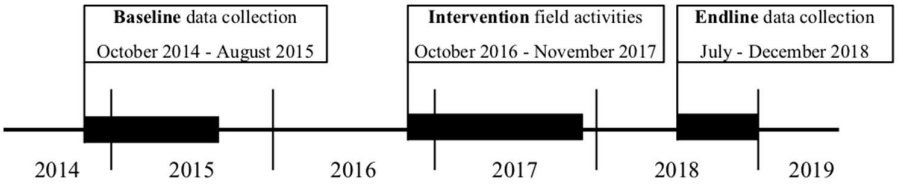


Figure A2: Map of geographic location sample schools

Angola

Kwanza Sul

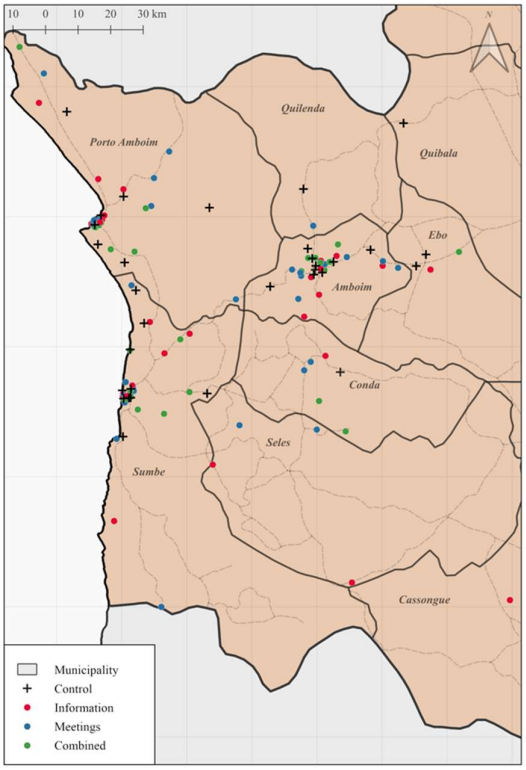


Figure A3a: Example of a scorecard (front)

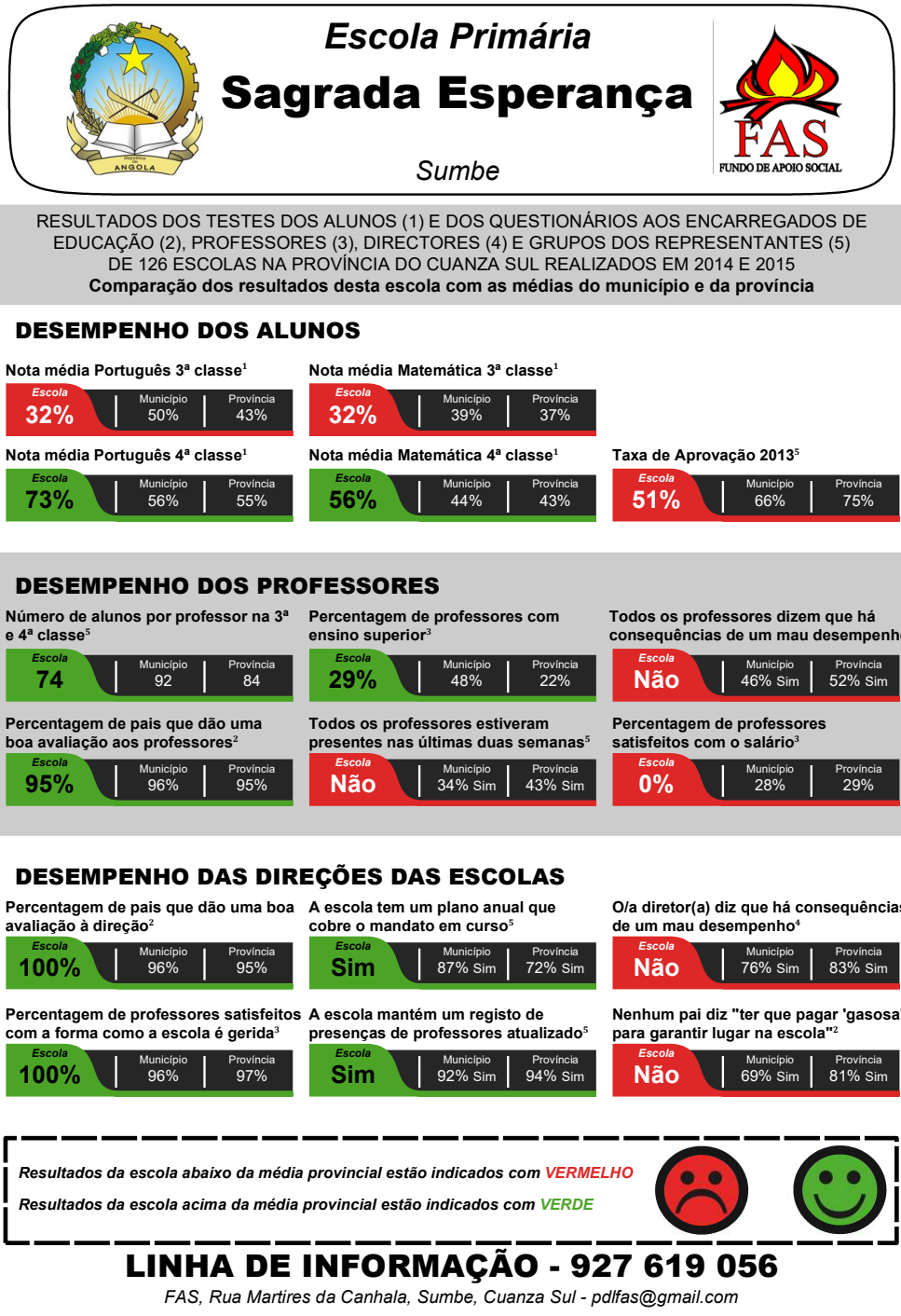
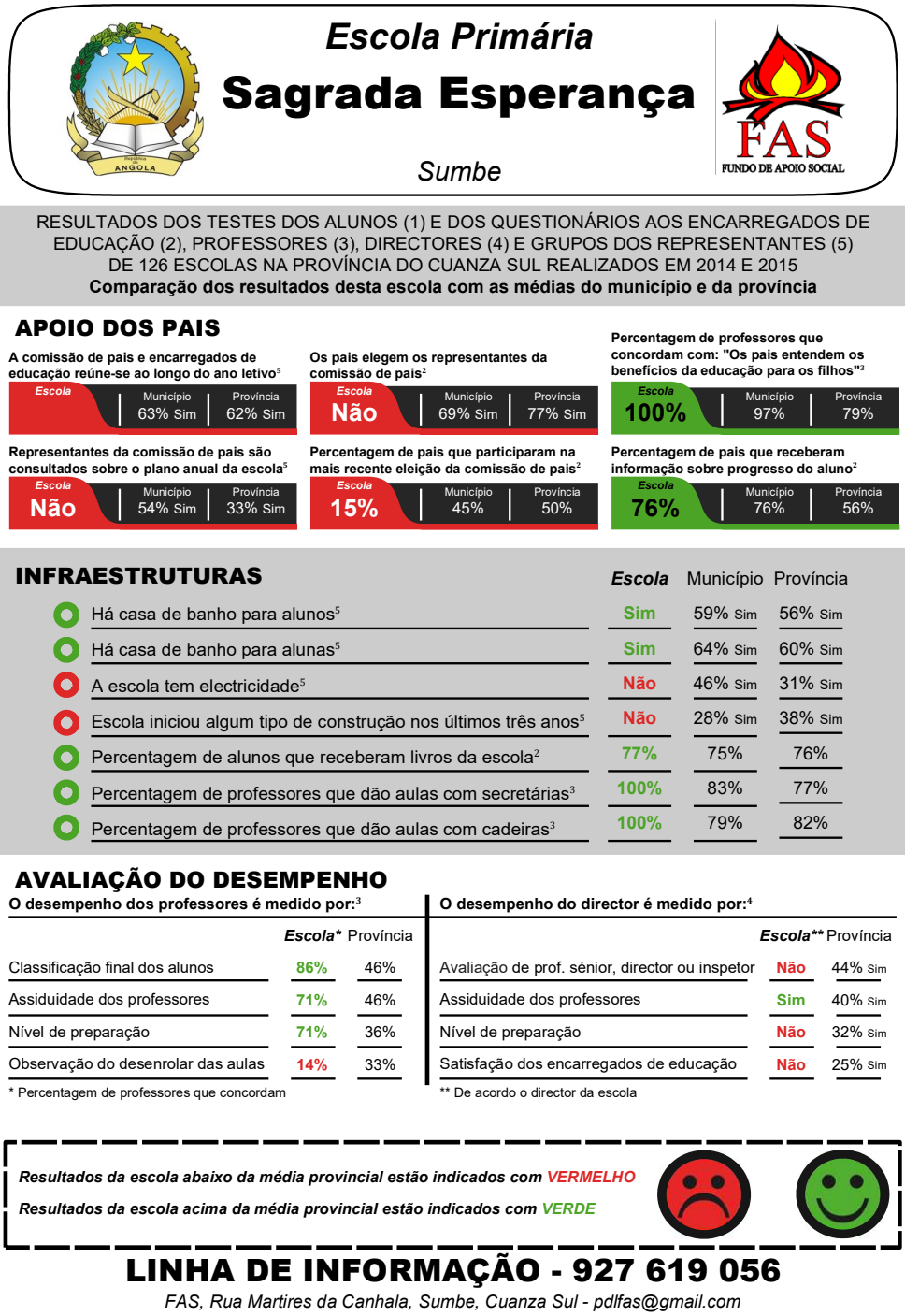


Figure A3b: Example of a scorecard (back)



Escola Primária
Sagrada Esperança
Sumbe

RESULTADOS DOS TESTES DOS ALUNOS (1) E DOS QUESTIONÁRIOS AOS ENCARREGADOS DE EDUCAÇÃO (2), PROFESSORES (3), DIRECTORES (4) E GRUPOS DOS REPRESENTANTES (5) DE 126 ESCOLAS NA PROVÍNCIA DO CUANZA SUL REALIZADOS EM 2014 E 2015
Comparação dos resultados desta escola com as médias do município e da província

APOIO DOS PAIS

	Escola	Município	Província
A comissão de pais e encarregados de educação reúne-se ao longo do ano letivo[5]		63% Sim	62% Sim
Os pais elegem os representantes da comissão de pais[2]	Não	69% Sim	77% Sim
Percentagem de professores que concordam com: "Os pais entendem os benefícios da educação para os filhos"[3]	100%	97%	79%
Representantes da comissão de pais são consultados sobre o plano anual da escola[5]	Não	54% Sim	33% Sim
Percentagem de pais que participaram na mais recente eleição da comissão de pais[2]	15%	45%	50%
Percentagem de pais que receberam informação sobre progresso do aluno[2]	76%	76%	56%

INFRAESTRUTURAS

	Escola	Município	Província
Há casa de banho para alunos[5]	Sim	59% Sim	56% Sim
Há casa de banho para alunas[5]	Sim	64% Sim	60% Sim
A escola tem electricidade[5]	Não	46% Sim	31% Sim
Escola iniciou algum tipo de construção nos últimos três anos[5]	Não	28% Sim	38% Sim
Percentagem de alunos que receberam livros da escola[2]	77%	75%	76%
Percentagem de professores que dão aulas com secretárias[3]	100%	83%	77%
Percentagem de professores que dão aulas com cadeiras[3]	100%	79%	82%

AVALIAÇÃO DO DESEMPENHO

O desempenho dos professores é medido por:[3]

	Escola*	Província
Classificação final dos alunos	86%	46%
Assiduidade dos professores	71%	46%
Nível de preparação	71%	36%
Observação do desenrolar das aulas	14%	33%

* Percentagem de professores que concordam

O desempenho do director é medido por:[4]

	Escola**	Província
Avaliação de prof. sénior, director ou inspetor	Não	44% Sim
Assiduidade dos professores	Sim	40% Sim
Nível de preparação	Não	32% Sim
Satisfação dos encarregados de educação	Não	25% Sim

** De acordo o director da escola

Resultados da escola abaixo da média provincial estão indicados com VERMELHO

Resultados da escola acima da média provincial estão indicados com VERDE

LINHA DE INFORMAÇÃO - 927 619 056

FAS, Rua Martires da Canhala, Sumbe, Cuanza Sul - pdlfas@gmail.com

Figure A4: Comic about parental involvement and education (translated to English)

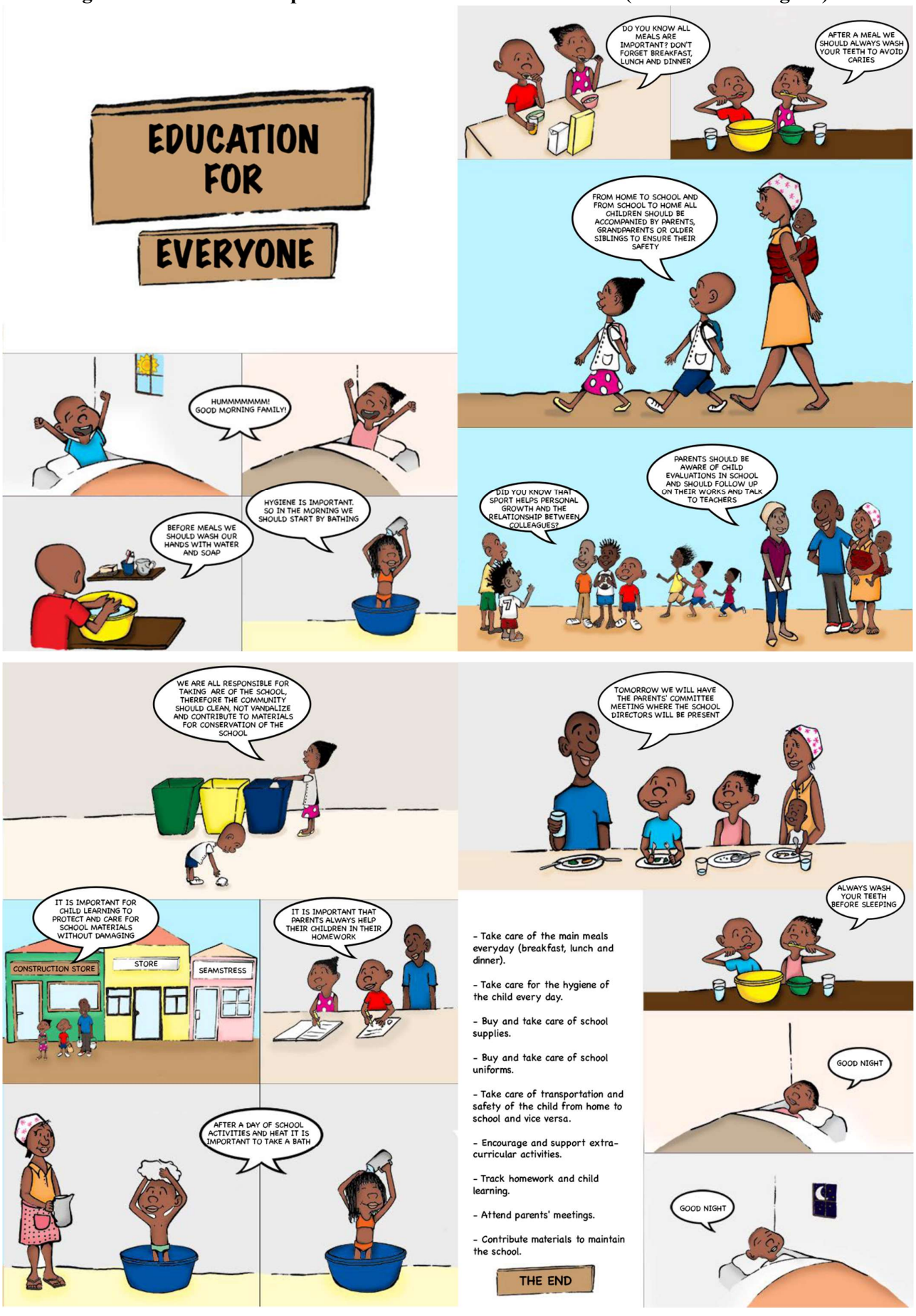


Figure A5: Teachers' giving to parents in the Dictator Game

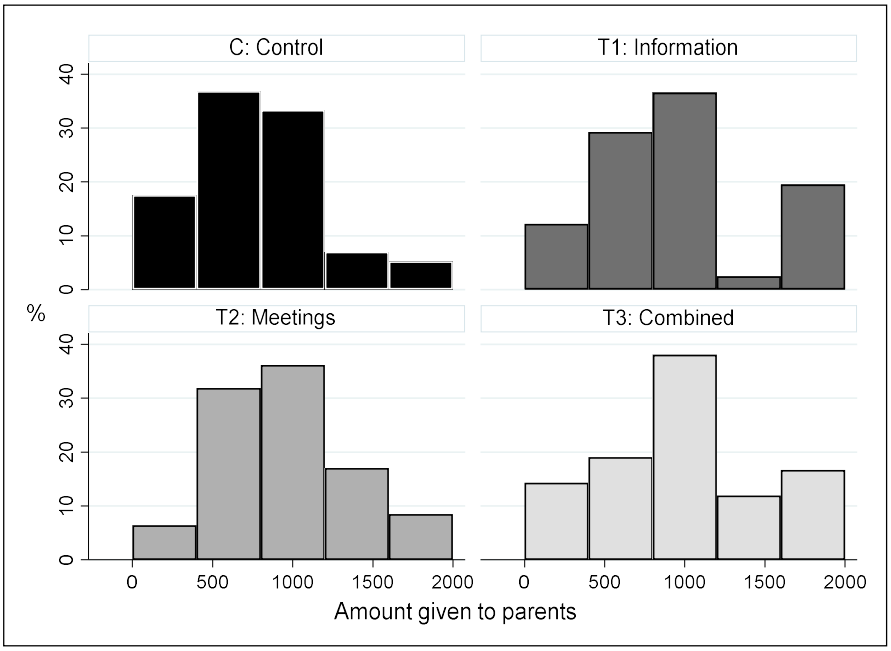


Table A1: Scorecard indicators

Indicator	Source
Student performance	
Average score Portuguese Language 3rd grade	Standardized tests
Average score Portuguese Language 4th grade	Standardized tests
Average score Mathematics 3rd grade	Standardized tests
Average score Mathematics 4th grade	Standardized tests
Approval Rate 2013	School survey
Teacher performance	
Number of students per teacher in 3rd and 4th grade	School survey
Percentage of parents giving a good evaluation to teachers	Parent survey
Percentage of teacher that completed higher education	Teacher survey
All teachers were present in the last two weeks (Yes/No)	School survey
All teachers say there are consequences of poor performance (Yes/No)	Teacher survey
Percentage of teachers satisfied with salary	Teacher survey
School managment performance	
Percentage of parents giving a good evaluation to school board	Parent survey
Percentage of teachers satisfied with how the school is managed	Teacher survey
The school has an annual plan covering the current mandate (Yes/No)	School survey
The school maintains an up-to-date teacher attendance record (Yes/No)	School survey
The school director says there are consequences of poor performance (Yes/No)	Director survey
No parent says, “I have to pay a bribe to secure a place in school” (Yes/No)	Parent survey
Parental support	
The parents’ committee meets throughout the school year (Yes/No)	School survey
Representatives of the parents’ committee are consulted about the school’s annual plan (Yes/No)	School survey
Parents elect parents' representatives (Yes/No)	Parent survey
Percentage of parents who participated in the most recent parents’ committee election	Parent survey
Percentage of teachers who agree with: “Parents understand the benefits of education for their children”	Teacher survey
Percentage of parents who received information about student progress	Parent survey
Facilities	
There is a bathroom for students (boys)	School survey
There is a bathroom for students (girls)	School survey
The school has electricity	School survey
School started some type of construction in the last three years	School survey
Percentage of students receiving school books	Parent survey
Percentage of teachers giving classes in classroom with desks	Teacher survey
Percentage of teachers giving classes in classroom with chairs	Teacher survey
Performance evaluation	
The performance of teachers is measured by: (percenage of teacher who agree)	
Final grade of students	Teacher survey
Teachers’ attendance	Teacher survey
Level of preparation	Teacher survey
In class observation	Teacher survey
The school director's performance is measured by:	
Rating of senior teacher, school director or inspector (Yes/No)	Director survey
Teachers’ attendance (Yes/No)	Director survey
Level of preparation (Yes/No)	Director survey
Parents’ satisfaction (Yes/No)	Director survey

Table A2: Sample size

Measurement type	Number of observations	
	Baseline	Endline
Standardized tests		
Grade 3 - Portuguese Language	5896	9578
Grade 3 - Mathematics	5787	9355
Grade 4 - Portuguese Language	4985	12152
Grade 4 - Mathematics	4937	12181
Grade 5 - Portuguese Language		6903
Grade 5 - Mathematics		6746
Surveys		
Parents	2350	1977
Teachers	731	1687
School Director	126	126
School Administration	126	126
Lab-in-field experiments		
Parents		1163
Teachers and School Directors		553

Table A3: Balance Tests: Measures of parents' mobilization and school management at baseline

Parents' mobilization	Survey type	Control group	T1: Information	T2: Meetings	T3: Combined	Joint F-stat p-value	T1 = T2 (F p-val)	T1 = T3 (F p-val)	T2 = T3 (F p-val)	Observations
In the past two weeks, how often have you or an adult in your home helped [name] with your homework? [Every day or almost every day (5) - never (0)]	Parent	4.083	0.035 (0.095)	0.110 (0.083)	0.141 (0.102)	0.423	0.449	0.358	0.767	2326
In the past month, how often have all members of your household sat down and eaten? [Every day or almost every day (5) - never (0)]	Parent	3.725	-0.022 (0.196)	0.028 (0.189)	0.098 (0.186)	0.924	0.793	0.526	0.702	2331
How often do you meet the teacher of [name]? [Once per week (6) - once per year (1)]	Parent	4.128	0.007 (0.155)	0.127 (0.169)	-0.061 (0.160)	0.721	0.453	0.651	0.255	1968
Did you receive any information about the achievement of [name] at school last year? [Yes (1) - No (0)]	Parent	0.608	-0.034 (0.060)	-0.116* (0.062)	0.015 (0.057)	0.216	0.240	0.461	0.055	2086
To what extent is this subject a problem in this school? "Lack of parent involvement in the school." [big problem (0) - not a problem (3)]	Teacher	1.291	-0.105 (0.181)	0.182 (0.167)	0.204 (0.157)	0.238	0.122	0.081	0.892	728
How many parents of students in your class(es) attend parent-teacher meetings? [number of parents; average over all classes if teacher is responsible for more than one.]	Teacher	19.557	0.478 (2.379)	1.753 (2.403)	1.302 (2.229)	0.850	0.502	0.622	0.791	565
Is there a parents' committee? [yes (1) - no (0)]	Teacher	0.924	-0.037 (0.044)	0.045 (0.033)	-0.024 (0.041)	0.024	0.019	0.759	0.029	635
Indicator based on the following question for each member of the school board: What type of member is this? Option 2: "parents representative".	School	0.062	0.063 (0.074)	0.002 (0.062)	0.002 (0.062)	0.826	0.418	0.418	1.000	126
School management										
To what extent do you agree or disagree? "The school director takes his or her responsibilities to the students very serious." [disagree a lot (1) - agree a lot (5)]	Parent	4.400	-0.029 (0.093)	-0.030 (0.098)	-0.068 (0.087)	0.884	0.991	0.639	0.667	2133
To what extent is this subject a problem in this school? "Unpreparedness of the the school staff." [big problem (0) - not a problem (3)]	Parent	1.908	-0.183 (0.163)	-0.122 (0.174)	-0.060 (0.158)	0.698	0.714	0.405	0.695	2344
Overall, how satisfied are you with the school's performance? [Very satisfied (4) - very unsatisfied (1)]	Parent	3.077	-0.001 (0.038)	-0.023 (0.038)	-0.001 (0.031)	0.904	0.560	0.999	0.476	2344
Z-score based on availability of 8 types of information: (1) Teacher list; (2) Teacher attendance; (3) Yearly school plan; (4) Results student exams; (5) List with names of school board members; (6) List with names of parent committee members; (7) Exam schedule; (8) Teacher evaluations.	School	0.034	0.054 (0.157)	-0.078 (0.136)	-0.116 (0.125)	0.681	0.440	0.298	0.794	126
School level z-score based on 4 types of facility problems from parent, teacher and director survey: To what extent is this subject a problem in this school? "Classes with too many students"; "Low quality of classrooms"; "Poor quality of sanitary facilities"; "Lack of teaching material" [big problem (0) - not a problem (3)]	Parent / Teacher / Director	0.028	-0.048 (0.098)	-0.145 (0.102)	0.046 (0.097)	0.244	0.319	0.307	0.049	126
Has the school started any construction or reconstruction projects in the last three years?	School	0.438	-0.063 (0.125)	-0.147 (0.122)	-0.018 (0.127)	0.621	0.482	0.724	0.294	126
Indicator for whether the school has student bathrooms.	School	0.594	-0.031 (0.125)	-0.013 (0.126)	0.148 (0.119)	0.395	0.886	0.136	0.183	126
Indicator for whether there is access to water at the school.	School	0.406	-0.250** (0.110)	-0.180 (0.117)	-0.019 (0.125)	0.063	0.490	0.038	0.171	126
How many desks does the school have today?	School	13.187	53.031** (24.235)	14.458 (9.337)	17.716 (12.678)	0.058	0.127	0.186	0.820	126
How many chairs does the school have today?	School	34.812	61.688** (29.546)	25.284 (17.087)	34.865 (22.487)	0.103	0.235	0.429	0.687	126
How many exercise books does the school have today?	School	33.000	-32.484 (27.725)	19.100 (40.597)	-17.867 (30.351)	0.128	0.085	0.239	0.252	121

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level.

Table A4: Balance tests at endline: School and parent characteristics

School	Control group	T1: Information	T2: Meetings	T3: Combined	Joint F-stat p-value	T1 = T2 (F p-val)	T1 = T3 (F p-val)	T2 = T3 (F p-val)	Observations
Number of teachers	14.969	0.594 (2.671)	1.451 (2.692)	-0.840 (2.692)	0.858	0.751	0.595	0.400	126
Number of classrooms	9.875	-0.469 (1.548)	2.222 (1.561)	-1.843 (1.561)	0.080	0.087	0.380	0.011	126
Number of students	672.687	111.906 (133.562)	171.054 (134.635)	-120.462 (134.635)	0.149	0.661	0.087	0.034	126
Years since establishment	29.857	-5.624 (5.024)	-5.165 (5.207)	-6.265 (5.157)	0.596	0.929	0.900	0.835	111
School offers classes after 6th grade	0.031	0.000 (0.054)	0.066 (0.054)	0.001 (0.054)	0.542	0.228	0.985	0.239	126
Distance to municipal capital (in km)	16.188	0.296 (4.453)	2.006 (4.453)	-2.575 (4.453)	0.786	0.704	0.524	0.309	125
School in urban area	0.375	0.094 (0.124)	-0.020 (0.125)	0.173 (0.125)	0.392	0.366	0.527	0.128	126
School performance	-0.210	0.349 (0.251)	0.184 (0.253)	0.308 (0.253)	0.508	0.516	0.872	0.628	126
Parents									
Female	0.453	0.052 (0.046)	0.047 (0.046)	0.046 (0.042)	0.630	0.921	0.895	0.981	1977
Age	40.426	-1.073 (0.890)	-0.699 (1.001)	-0.443 (1.092)	0.680	0.687	0.539	0.820	1969
Primary education	0.608	-0.011 (0.061)	-0.015 (0.062)	-0.050 (0.058)	0.852	0.953	0.540	0.586	1976
Number of children	4.617	0.538* (0.275)	0.037 (0.220)	0.162 (0.232)	0.221	0.062	0.176	0.576	1977
Speak Portuguese at home	0.940	-0.002 (0.020)	0.008 (0.023)	0.009 (0.022)	0.921	0.615	0.552	0.958	1976
Member of local social group	0.317	0.021 (0.041)	-0.023 (0.040)	-0.024 (0.039)	0.664	0.295	0.279	0.985	1977
Total value assets (in 1000 AKZ)	943.987	815.170 (633.647)	483.626 (393.246)	302.007 (351.887)	0.423	0.630	0.441	0.680	1858
Student is female	0.515	-0.025 (0.034)	-0.038 (0.036)	-0.025 (0.034)	0.754	0.709	0.978	0.690	1977
Student age	11.265	0.036 (0.229)	0.040 (0.215)	0.061 (0.205)	0.992	0.988	0.918	0.927	1973

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. "School performance" is a z-score constructed out of all scorecard indicators at baseline value. All scorecard indicators are fully described in Table A1.

Table A5: Balance tests at endline: Teacher and school director characteristics

Teachers	Control group	T1: Information	T2: Meetings	T3: Combined	Joint F-stat p-value	T1 = T2 (F p-val)	T1 = T3 (F p-val)	T2 = T3 (F p-val)	Observations
Female	0.644	-0.051 (0.074)	0.018 (0.067)	-0.011 (0.079)	0.792	0.317	0.618	0.693	1570
Age	38.319	0.906 (0.679)	0.369 (0.864)	1.358* (0.759)	0.298	0.473	0.470	0.231	1570
Higher education	0.409	0.076 (0.076)	0.027 (0.072)	0.098 (0.072)	0.517	0.516	0.771	0.319	1570
Number of children	3.609	0.298 (0.246)	0.205 (0.207)	0.183 (0.254)	0.650	0.676	0.666	0.924	1569
Language spoken at home is Portuguese	0.968	-0.004 (0.019)	0.015 (0.016)	0.019 (0.015)	0.274	0.192	0.089	0.725	1570
Member of local social group	0.567	0.020 (0.064)	-0.043 (0.056)	-0.029 (0.054)	0.687	0.279	0.383	0.764	1570
Total value assets (in 1000 AKZ)	2423.514	204.391 (727.074)	152.812 (745.639)	23.321 (721.235)	0.990	0.943	0.794	0.856	1495
Director									
Female	0.062	0.125 (0.098)	0.163* (0.098)	0.228** (0.098)	0.131	0.697	0.298	0.516	126
Age	48.531	-0.344 (1.747)	-1.693 (1.761)	-1.402 (1.761)	0.733	0.445	0.549	0.870	126
Higher education	0.562	-0.000 (0.123)	0.147 (0.124)	0.018 (0.124)	0.585	0.239	0.884	0.305	126
Number of children	6.438	-0.531 (0.952)	-0.857 (0.959)	-2.373** (0.959)	0.087	0.735	0.057	0.119	126
Speak Portuguese at home	0.938	0.000 (0.049)	0.062 (0.050)	0.030 (0.050)	0.540	0.210	0.543	0.520	126
Member of local social group	0.531	-0.094 (0.126)	0.049 (0.127)	-0.112 (0.127)	0.539	0.262	0.887	0.210	126
Total value assets (in 1000 AKZ)	4262.206	-708.431 (1610.077)	-1165.603 (1636.272)	-659.918 (1650.547)	0.915	0.779	0.976	0.762	122

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level.

Table A6: Dependent variables - description (1)

Dependent variable	**Source**	
- Explanation of variable and/or phrasing of question		*Scale*
Parents' mobilization		
At home index	**Parent survey**	
- In the past two weeks, how many days have you or any adult in your household helped your child do his homework? [in days]		*0-14*
- For the past two weeks, how many days did all the members of your household sit down and eat together? [in days]		*0-14*
- How often does the following situation occur? "I keep clear rules in my house that my child must obey." [never (0) - very frequent (5)]		*0-5*
- How often does the following situation occur? "I keep a regular wake up and sleep schedule for my child" [never (0) - very frequent (5)]		*0-5*
At school index	**Parent survey**	
- In the past four weeks, how many times did you go to the school to talk to the teacher about your child's performance? [in days]		*0-20*
- In the previous school year, how often did the following situation occur? "You received some information about your child's performance at school." [never (0) - every week (7)]		*0-7*
According to teacher index	**Teacher survey**	
- To what extent do you agree or disagree? "The involvement of parents and guardians at this school is high." [disagree a lot (1) - agree a lot (5)]		*1-5*
- To what extent is this subject a problem in this school? "Lack of parent involvement in the school." [big problem (0) - not a problem (3)]		*0-3*
- To what extent do you agree or disagree? "The parents and guardians of this school are always available to help with extracurricular activities." [disagree a lot (1) - agree a lot (5)]		*1-5*
- How many parents of students in your class(es) attend parent-teacher meetings? [number of parents; average over all classes if teacher is responsible for more than one.]		
- How do you think the performance of the parents' committee has been? [very bad (1) - very good (5)]		*1-5*
Formal participation index	**School and parent survey**	
- Is there a parents' committee? [yes (1) - no (0)]		*0-1*
- How many members does the parents' committee have? [number of parents]		
- Indicator based on the following question: Which of the following representatives are members of the school board? Options to be read one by one; option 2: "parents representative".		*0-1*
- School average of parents survey question: During the previous school year, how often did the following situation occur? "You went to your child's school to attend the general meetings" [never (0) - every week (7)]		*0-7*
School management		
Management satisfaction index	**Parent survey**	
- To what extent do you agree or disagree? "The school director takes his or her responsibilities to the students very serious." [disagree a lot (1) - agree a lot (5)]		*1-5*
- To what extent is this subject a problem in this school? "Unpreparedness of the the school staff." [big problem (0) - not a problem (3)]		*0-3*
- To what extent do you agree or disagree? "The school is doing a good job of preparing the children for their future." [disagree a lot (1) - agree a lot (5)]		*1-5*
Public information index	**School survey**	
- Z-score based on availability of 8 types of information: Of the following types of information, which are publicly displayed at school? Options to be read one by one: (1) Teacher list; (2) Teacher attendance; (3) Yearly school plan; (4) Results student exams; (5) List with names of school board members; (6) List with names of parent committee members; (7) Exam schedule; (8) Teacher evaluations.		*0-1*
Facilities satisfaction index	**Parent, teacher and director survey**	
- School level z-score based on 9 types of facility problems from parent, teacher and director survey: To what extent is this subject a problem in this school? "Insufficient number of classrooms"; "Low quality of classrooms"; "Poor quality of sanitary facilities"; "Low quality of other facilities"; "Lack of furniture"; "Lack of teaching material"; "Lack of security"; "Lack of electricity and light"; "Lack of water" [big problem (0) - not a problem (3)]		*0-3*

Table A7: Dependent variables - description (2)

Dependent variable	Source	
- Explanation of variable and/or phrasing of question		*Scale*
Safety index	**Facilities survey / observed**	
- Number of classrooms that have undergone any construction or improvement during the two previous school years and this year (2016, 2017 and 2018)? Observed by enumerator, using the facilities survey.		
- Does the school have someone hired for school safety? Observed by enumerator, using the facilities survey.		*0-1*
- Indicator for whether the school has a fence or wall. Observed by enumerator, using the facilities survey.		*0-1*
- Has there been any construction or improvement of the fence during the two previous school years and this year (2016, 2017 and 2018)? Observed by enumerator, using the facilities survey.		*0-1*
Hygiene index	**Facilities survey / observed / administrative data**	
- Does the school have someone hired to clean the school? Observed by enumerator, using the facilities survey.		*0-1*
- Indicator for whether the school has student bathrooms. Observed by enumerator, using the facilities survey.		*0-1*
- Indicator for whether there is access to water at the school. Administrative data.		*0-1*
Material index	**Facilities survey / observed**	
- The variable "percentage of usable student desks" is created using the total number of student desks and the total number of broken student desks. Observed by enumerator, using the facilities survey.		*0-1*
- Has the school received, purchased or invested in new exercise books since the beginning of 2016?		*0-1*
- Has the school received, purchased or invested in new boxes with chalk since the beginning of 2016?		*0-1*
Teachers' performance		
Teacher attendance	**Observed**	
- During the two endline visits, the presence of all the teachers was checked by one of the enumerators. This is the average presence per teacher over these two visits.		*0-1*
Teacher satisfaction index (P)	**Parent survey**	
- How do you evalutate the performance of your child's teacher? [very bad (1) - very good (5)]		*1-5*
- To what extent is this subject a problem in this school? "Absence of teachers." [big problem (0) - not a problem (3)]		*0-3*
- To what extent is this subject a problem in this school? "Low teachers performance." [big problem (0) - not a problem (3)]		*0-3*
- To what extent is this subject a problem in this school? "Low motivation of teachers." [big problem (0) - not a problem (3)]		*0-3*
To what extent do you agree or disagree? "You feel that your child's teacher cares about him." [disagree a lot (1) - agree a lot (5)]		*1-5*
Teacher satisfaction index (D)	**Director survey**	
- How do you evaluate the performance of all teachers? [very bad (1) - very good (5)]		*1-5*
- To what extent is this subject a problem in this school? "Absence of teachers." [big problem (0) - not a problem (3)]		*0-3*
- To what extent is this subject a problem in this school? "Low teachers performance." [big problem (0) - not a problem (3)]		*0-3*
- To what extent is this subject a problem in this school? "Low motivation of teachers." [big problem (0) - not a problem (3)]		*0-3*
Dictator game: sending decision	**Lab experiment teachers**	
- Sending decision relative to the total endowment availble to allocate.		*0-1*
Students' performance		
Satisfaction student performance	**Parent survey**	
- How do you think your child has been doing in school? [very bad (1) - very good (5)]		*1-5*
Student attendance	**Observed**	
- During the first endline visit, during which the standardized tests were conducted, the presence of the randomly selected students was checked by one of the enumerators.		*0-1*
Aggregate test score	**Standardized tests**	
- Standardized test scores. This variable includes all Portuguese Language and Mathematics testscores for grades 3 and 4.		*0-10*
Share of repeaters grades 1-6	**Administrative data**	
- Number of repeaters divided the total number of students in each grade, aggregated over all grades.		

Table A8: Treatment effects on individual dependent variables (1)

Parents' mobilization	*Survey* ↓	Control group mean	T1: Information		T2: Meetings		T3: Combined		R-squared	Observations
			Coefficient	SD	Coefficient	SD	Coefficient	SD		
At home index										
Homework	P	2.865	0.650**	(0.264)	0.683**	(0.290)	0.838***	(0.315)	0.102	1800
Sit down and eat together	P	5.093	0.537	(0.406)	0.012	(0.480)	0.566	(0.473)	0.042	1845
Rules at home	P	3.732	0.190***	(0.065)	-0.038	(0.065)	0.058	(0.058)	0.058	1932
Regular wake up and sleep schedule	P	3.657	0.183**	(0.078)	0.072	(0.084)	0.009	(0.074)	0.046	1936
At school index										
Talk to the teacher	P	1.924	0.226	(0.166)	0.415**	(0.193)	0.171	(0.186)	0.094	1919
Receive some information	P	2.139	0.262	(0.170)	0.212	(0.171)	-0.035	(0.165)	0.091	1884
According to teacher index										
Parental involvement statement 1	T	2.762	0.145	(0.151)	0.186	(0.156)	0.266**	(0.120)	0.084	1565
Parental involvement statement 2	T	0.546	0.182**	(0.076)	0.255***	(0.080)	0.135*	(0.081)	0.034	1568
Availability of parents	T	3.329	0.293**	(0.146)	0.192	(0.149)	0.234	(0.160)	0.083	1555
Number of parents attending meetings	T	21.164	-0.671	(1.362)	0.983	(1.475)	0.215	(1.178)	0.087	1263
Performance parents' committee	T	3.520	0.113	(0.092)	0.045	(0.080)	0.146**	(0.074)	0.095	1538
Formal participation index										
Parent's committee at school	S	0.906	0.063	(0.074)	0.032	(0.077)	0.094*	(0.056)	0.052	126
Number of parent's committee members	S	2.500	0.303	(0.581)	1.159**	(0.563)	1.142*	(0.643)	0.185	126
School board has a parent representative	S	0.281	-0.065	(0.121)	0.308**	(0.130)	0.164	(0.131)	0.117	126
Parent participation in general meetings	P	2.273	0.229	(0.159)	0.293**	(0.135)	0.176	(0.152)	0.048	1900
School management										
Management satisfaction index										
Responsible school director	P	4.702	0.046	(0.054)	-0.063	(0.050)	0.078*	(0.047)	0.032	1864
Preparedness of school staff	P	1.528	0.097	(0.111)	-0.067	(0.111)	0.107	(0.121)	0.032	1607
School works well for future students	P	4.882	0.041*	(0.024)	-0.005	(0.032)	0.054**	(0.024)	0.025	1934
Public information index										
Teachers list publicly available	S	0.500	-0.181	(0.121)	-0.095	(0.128)	0.103	(0.127)	0.183	126
Teachers attendance information publicly available	S	0.094	0.028	(0.072)	0.073	(0.073)	0.126	(0.079)	0.167	126
Yearly school plan publicly available	S	0.281	0.077	(0.121)	-0.096	(0.101)	0.099	(0.121)	0.088	126
Student results publicly available	S	0.969	-0.063	(0.065)	-0.123*	(0.071)	-0.002	(0.064)	0.121	126
Board members list publicly available	S	0.281	0.017	(0.112)	0.061	(0.117)	0.126	(0.116)	0.150	126
Parent committee list publicly available	S	0.188	0.112	(0.120)	0.148	(0.110)	0.157	(0.113)	0.091	126
Exam time information publicly available	S	0.875	-0.043	(0.092)	0.085	(0.076)	0.107	(0.073)	0.122	126
Teacher evaluation information publicly available	S	0.094	0.106	(0.078)	0.059	(0.069)	0.158**	(0.074)	0.234	126
Facilities satisfaction index										
Number of classrooms	P	0.877	-0.126	(0.101)	-0.092	(0.109)	0.007	(0.118)	0.025	1850
Quality of classrooms	P	0.796	-0.103	(0.108)	-0.084	(0.108)	0.168	(0.143)	0.034	1824
Availability and quality of classrooms	P	0.695	-0.082	(0.094)	-0.145	(0.099)	0.070	(0.134)	0.039	1794
Availability and quality of other facilities	P	0.795	-0.079	(0.102)	-0.103	(0.091)	0.140	(0.137)	0.035	1750
Availability of furniture	P	0.445	0.077	(0.099)	-0.004	(0.092)	0.228	(0.139)	0.034	1870
Availability of school materials	P	0.630	0.064	(0.084)	-0.090	(0.082)	0.134	(0.129)	0.027	1797
Availability of security	P	0.663	-0.142	(0.117)	-0.274***	(0.103)	0.103	(0.143)	0.049	1874
Availability of electricity and light	P	0.772	0.006	(0.151)	-0.158	(0.122)	0.078	(0.171)	0.152	1907
Availability of water	P	0.576	0.050	(0.111)	-0.139	(0.099)	0.365**	(0.163)	0.122	1914
Number of classrooms	D	0.844	0.147	(0.319)	-0.319	(0.308)	0.426	(0.334)	0.195	125
Quality of classrooms	D	0.625	-0.381*	(0.219)	-0.121	(0.248)	0.202	(0.274)	0.138	124
Availability and quality of classrooms	D	0.500	-0.009	(0.239)	-0.132	(0.237)	0.357	(0.282)	0.167	125
Availability and quality of other facilities	D	0.469	-0.003	(0.234)	0.158	(0.273)	0.130	(0.287)	0.120	125
Availability of furniture	D	0.344	0.361	(0.219)	0.149	(0.224)	0.565**	(0.265)	0.173	126
Availability of school materials	D	0.719	0.554*	(0.283)	0.545*	(0.294)	0.596*	(0.304)	0.154	125
Availability of security	D	0.219	-0.202	(0.125)	0.070	(0.197)	0.337	(0.238)	0.218	126
Availability of electricity and light	D	1.000	-0.216	(0.318)	-0.118	(0.339)	-0.123	(0.353)	0.276	126
Availability of water	D	0.375	0.347	(0.232)	0.312	(0.256)	0.569**	(0.273)	0.263	125

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. See the notes of Tables 3 and 6 for the definition of controls and outcome variables employed. All dependent variables are fully described in Table A6 in Appendix. The sources of these dependent variables are the parent survey (P), teacher survey (T), school survey (S) and director survey (D).

Table A9: Treatment effects on individual dependent variables (2)

School management (continued)	*Survey ↓*	Control group mean	T1: Information		T2: Meetings		T3: Combined		R-squared	Observations
			Coefficient	SD	Coefficient	SD	Coefficient	SD		
Number of classrooms	T	0.650	-0.009	(0.114)	-0.184	(0.114)	0.127	(0.116)	0.056	1563
Quality of classrooms	T	0.559	-0.048	(0.106)	-0.084	(0.099)	0.094	(0.104)	0.052	1566
Availability and quality of classrooms	T	0.479	0.045	(0.116)	0.095	(0.111)	0.140	(0.120)	0.055	1565
Availability and quality of other facilities	T	0.561	-0.091	(0.093)	-0.034	(0.086)	0.117	(0.099)	0.045	1556
Availability of furniture	T	0.409	0.049	(0.126)	-0.065	(0.094)	0.212*	(0.114)	0.061	1569
Availability of school materials	T	0.550	0.025	(0.083)	-0.005	(0.080)	0.093	(0.095)	0.031	1559
Availability of security	T	0.622	-0.107	(0.138)	-0.051	(0.146)	0.212	(0.136)	0.070	1567
Availability of electricity and light	T	0.984	-0.071	(0.182)	-0.005	(0.188)	0.067	(0.199)	0.164	1564
Availability of water	T	0.533	0.164	(0.146)	0.238*	(0.141)	0.457**	(0.183)	0.169	1569
Safety index										
Total number of classrooms that were improved	F	1.844	-0.555	(0.652)	-0.414	(0.613)	-0.241	(0.556)	0.202	126
Security personel	F	0.188	-0.027	(0.079)	-0.032	(0.090)	0.115	(0.094)	0.336	125
Fence/wall around school	F	0.469	-0.017	(0.122)	0.046	(0.126)	0.210*	(0.124)	0.203	126
Fence was recently improved or constructed	F	0.156	0.040	(0.086)	0.078	(0.098)	0.310***	(0.113)	0.281	126
Hygiene index										
Cleaning personel	F	0.312	-0.022	(0.102)	-0.050	(0.110)	0.098	(0.107)	0.286	126
Bathrooms for students	F	0.438	-0.069	(0.129)	0.149	(0.127)	0.103	(0.127)	0.143	126
Water at the school	A	0.219	0.040	(0.098)	-0.082	(0.095)	0.118	(0.105)	0.295	123
Material index										
Share of usable chairs	F	0.702	-0.028	(0.086)	0.049	(0.073)	0.171**	(0.066)	0.170	126
New exercise books	F	0.219	0.131	(0.118)	0.221*	(0.115)	0.144	(0.116)	0.186	126
New boxes with chalk	F	0.719	-0.204	(0.130)	-0.164	(0.120)	0.073	(0.115)	0.180	126
Teachers' performance										
Teacher attendance										
Share of teachers present 1	O	0.755	0.059	(0.043)	-0.016	(0.056)	0.017	(0.045)	0.103	1564
Share of teachers present 2	O	0.675	-0.002	(0.081)	-0.080	(0.084)	0.089	(0.082)	0.093	1564
Teacher satisfaction index (P)										
Teacher performance 1	P	4.233	0.040	(0.053)	-0.029	(0.049)	0.002	(0.051)	0.014	1909
Teacher absence	P	1.439	0.088	(0.117)	-0.149	(0.115)	0.021	(0.113)	0.036	1774
Teacher performance 2	P	1.339	0.179*	(0.105)	-0.042	(0.094)	0.210*	(0.113)	0.030	1652
Teacher motivation	P	1.356	0.174*	(0.098)	-0.017	(0.091)	0.070	(0.100)	0.035	1668
Agree or disagree: Teacher cares for student	P	4.730	0.088	(0.056)	0.065	(0.045)	0.154***	(0.047)	0.033	1912
Teacher satisfaction index (D)										
Teacher performance 1	D	3.938	-0.056	(0.105)	0.043	(0.122)	-0.140	(0.175)	0.183	126
Teacher absence	D	2.031	0.430	(0.263)	0.124	(0.278)	0.206	(0.262)	0.144	124
Teacher performance 2	D	1.906	0.405	(0.297)	0.020	(0.307)	0.312	(0.301)	0.164	126
Teacher motivation	D	1.250	0.039	(0.331)	-0.377	(0.310)	0.380	(0.327)	0.219	126
Dictator game: sending decision										
Percentage total endowment sent	L	0.361	0.087	(0.065)	0.137**	(0.063)	0.202***	(0.057)	0.186	169
Students' performance										
Satisfaction student performance										
Performance evaluation: child respondent	P	3.894	0.119**	(0.050)	0.053	(0.050)	0.113**	(0.051)	0.029	1937
Student attendance										
Share of students present	O	0.593	-0.069	(0.064)	0.025	(0.056)	-0.007	(0.062)	0.042	4628
Aggregate test score										
Test score Portuguese Language - grade 3	X	5.615	0.064	(0.303)	0.078	(0.291)	0.155	(0.352)	0.073	18816
Test score Mathematics - grade 3	X	5.356	0.232	(0.292)	0.003	(0.291)	0.488	(0.349)	0.068	18369
Test score Portuguese Language - grade 4	X	5.224	0.200	(0.352)	-0.007	(0.327)	0.285	(0.377)	0.101	23902
Test score Mathematics - grade 4	X	5.274	0.262	(0.298)	0.075	(0.293)	0.279	(0.288)	0.059	23960
Share of repeaters grade 1-6										
Share of repeaters	A	0.139	-0.029	(0.025)	-0.045*	(0.026)	-0.029	(0.022)	0.165	123

Note: * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. See the notes of Tables 3 and 6 for the definition of controls and outcome variables employed. All dependent variables are fully described in Table A6 in Appendix. The sources of these dependent variables are the parent survey (P), school survey (S), director survey (D), facilities survey (F), administrative data (A), direct observation (O), lab experiment (L) and standardized tests (X).

Table A10: Treatment effects on parents' mobilization

Dep. variable source --->	Parent survey		Teacher survey	School and parent survey
Dependent variable --->	At home	At school	According to teacher	Formal participation
	(1)	(2)	(3)	(4)
T1: Information	**0.247*** **	**0.116**	**0.127***	**0.275**
	(0.063)	(0.075)	(0.072)	(0.287)
	[0.000]	*[0.208]*	*[0.178]*	*[0.426]*
T2: Meetings	**0.129***	**0.203*** **	**0.120**	**0.634** **
	(0.075)	(0.076)	(0.080)	(0.296)
	[0.149]	*[0.040]*	*[0.198]*	*[0.079]*
T3: Combined	**0.160** **	**0.042**	**0.165** **	**0.535** **
	(0.063)	(0.076)	(0.066)	(0.235)
	[0.030]	*[0.564]*	*[0.030]*	*[0.030]*
Mean dep. variable (control)	0.000	0.000	0.000	0.000
R-squared	0.107	0.167	0.158	0.374
Observations	1956	1937	1569	126
T1 = T2 (F p-val)	0.126	0.197	0.937	0.257
T1 = T3 (F p-val)	0.189	0.316	0.619	0.285
T2 = T3 (F p-val)	0.664	0.035	0.592	0.710
T1 + T2 = T3 (F p-val)	0.028	0.014	0.466	0.328
Joint F-stat (p-val)	0.002	0.051	0.071	0.082

Note: Estimates based on OLS regressions as specified in section 5. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. P-values adjusted for multiple hypothesis testing grouped by rows are presented in brackets. The regressions include full controls, namely block and municipality dummies, school controls and for regressions (1) and (2) parent controls and for regression (3) teacher controls. School controls are number of teachers, number of classrooms, and number of students. Parent controls are parent gender, whether the parent has completed primary school, whether the parent has a partner, and number of children; they also include the age of the student, his/her gender, grade and relation to respondent. Teacher controls are teacher age, gender, whether the teacher has completed higher education, whether the teacher has a partner, number of children, years of experience and the corresponding class grade. All dependent variables in this table are indices. The "At home" index includes helping with homework, family meals, clear rules and regular sleeping scedule. The "At school" index includes meeting with teacher and collecting information on child's performance. The "According to teacher" index includes evaluations of the involvement and availability of parents, the number of parents participating in parent-teacher meetings and the opinion about the parents' committee. The "Formal participation" index includes the average parents' attendance of school assemblies, existence of a parents' committee, the number of parents' committee members and whether there is a parents' representative in the school board. All dependent variables are z-score indices and are fully described in Table A6 in Appendix.

Table A11: Treatment effects on school management and school facilities

Dep. variable source --->	Parent survey	All individual surveys	School survey	Facilities observation survey		
Dependent variable --->	**Management satisfaction**	**Facilities satisfaction**	**Public information**	**Safety**	**Hygiene**	**Teaching Materials**
	(1)	**(3)**	**(2)**	**(4)**	**(5)**	**(6)**
T1: Information	**0.103**	**0.033**	**0.003**	**-0.062**	**0.042**	**-0.178**
	(0.063)	(0.222)	(0.267)	(0.244)	(0.205)	(0.305)
	[0.455]	*[0.970]*	*[0.980]*	*[0.960]*	*[0.960]*	*[0.960]*
T2: Meetings	**-0.062**	**0.046**	**0.090**	**0.263**	**0.261**	**0.244**
	(0.073)	(0.296)	(0.268)	(0.260)	(0.249)	(0.308)
	[0.851]	*[0.941]*	*[0.941]*	*[0.802]*	*[0.792]*	*[0.851]*
T3: Combined	**0.178*****	**0.789****	**0.516***	**0.667****	**0.348**	**0.593****
	(0.063)	(0.306)	(0.299)	(0.306)	(0.231)	(0.281)
	[0.020]	*[0.050]*	*[0.129]*	*[0.119]*	*[0.139]*	*[0.119]*
Mean dep. variable (control)	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.046	0.483	0.404	0.605	0.537	0.425
Observations	1952	126	126	126	126	126
T1 = T2 (F p-val)	0.026	0.959	0.724	0.196	0.309	0.193
T1 = T3 (F p-val)	0.282	0.012	0.075	0.018	0.134	0.009
T2 = T3 (F p-val)	0.002	0.044	0.122	0.189	0.734	0.236
T1 + T2 = T3 (F p-val)	0.185	0.111	0.276	0.243	0.892	0.211
Joint F-stat (p-val)	0.003	0.059	0.265	0.087	0.300	0.047

Note: Estimates based on OLS regressions as specified in section 5. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. P-values adjusted for multiple hypothesis testing grouped by rows are presented in brackets. The regressions include full controls, namely block and municipality dummies, school controls and for regression (1) parent controls. School controls are number of teachers, number of classrooms, and number of students. Parent controls are parent gender, whether the parent has completed primary school, whether the parent has a partner, and number of children; they also include the age of the student, his/her gender, grade and relation to respondent. All dependent variables in this table are indices. The "Management satisfaction" index includes responsible behavior of director, preparedness of school staff and a general evaluation of the school. The "Public information" index includes 8 types of information (see Table A6 in Appendix for the details). The "Facilities satisfaction" index includes 9 types of potential facility problems (see Table A6 in Appendix for the details). The "Safety" index includes construction or improvement of classrooms, security staff, fence or wall and construction or improvement of the fence or wall. The "Hygiene" index includes cleaning staff, bathrooms and water access. The "Material" index includes the share of usable chairs, new exercise books and new boxes with chalk. All dependent variables are z-score indices and are fully described in Tables A6 and A7 in Appendix.

Table A12: Treatment effects on teachers' performance

Dep. variable source --->	Observed	Parents survey	Director survey	Behavioral measure
Dependent variable --->	Teacher attendance	Teacher satisfaction index (P)	Teacher satisfaction index (D)	Dictator game: giving decision
	(1)	(2)	(3)	(4)
T1: Information	**0.018**	**0.139****	**0.343**	**0.140***
	(0.039)	(0.060)	(0.302)	(0.075)
	[0.634]	*[0.139]*	*[0.356]*	*[0.198]*
T2: Meetings	**-0.037**	**0.041**	**0.098**	**0.158***
	(0.044)	(0.068)	(0.355)	(0.090)
	[0.802]	*[0.802]*	*[0.802]*	*[0.248]*
T3: Combined	**0.051**	**0.174*****	**0.322**	**0.286*****
	(0.042)	(0.067)	(0.349)	(0.082)
	[0.465]	*[0.040]*	*[0.465]*	*[0.000]*
Mean dep. variable (control)	0.715	0.000	0.000	0.361
R-squared	0.210	0.071	0.325	0.283
Observations	1564	1948	126	169
T1 = T2 (F p-val)	0.164	0.134	0.497	0.760
T1 = T3 (F p-val)	0.411	0.617	0.948	0.096
T2 = T3 (F p-val)	0.067	0.053	0.583	0.195
T1 + T2 = T3 (F p-val)	0.265	0.958	0.808	0.934
Joint F-stat (p-val)	0.302	0.014	0.669	0.012

Note: Estimates based on OLS regressions as specified in section 5. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. P-values adjusted for multiple hypothesis testing grouped by rows are presented in brackets. The regressions include full controls, namely block and municipality dummies and school controls. Furthermore, regression (1) includes teacher controls, regression (2) includes parent controls, regression (3) includes school director controls and regression (4) includes teacher game controls. School controls are number of teachers, number of classrooms, and number of students. Parent controls are parent gender, whether the parent has completed primary school, whether the parent has a partner, and number of children; they also include the age of the student, his/her gender, grade and relation to respondent. School director controls are director age, gender, whether the director has completed higher education, whether the director has a partner and number of children. Teacher controls are teacher age, gender, whether the teacher has completed higher education, whether the teacher has a partner, number of children, years of experience and the corresponding class grade. Teacher game controls are teacher age, gender, whether the teacher has completed higher education, whether the teacher has a partner, number of children, the number of game participants and the number of familiar game participants. Both "Teacher satisfaction" indices include, a subjective measure of teacher absentism and evaluations of teacher performance and motivation. Additionally the parent survey based index includes performance evaluations specific to the teacher of the parent's child. The dependent variable in column (1) is the average attendance across the two data collection visits. The dependent variables in columns (2) and (3) are z-score indices. The dependent variable in column (4) is the share of the teacher's initial endowment sent to the parents. All dependent variables are fully described in Table A7 in Appendix.

Table A13: Treatment effects on students' performance

Dep. variable source --->	Parent survey	Administrative data	Observed	Standardized tests
Dependent variable --->	Satisfaction student performance	Share of repeaters grades 1-6	Student attendance	Aggregate test score (PT/MAT; grade 3 and 4)
	(1)	(2)	(3)	(4)
T1: Information	**0.114***	**-0.029**	**-0.068**	**0.048**
	(0.065)	(0.027)	(0.057)	(0.091)
	[0.218]	*[0.535]*	*[0.535]*	*[0.564]*
T2: Meetings	**0.081**	**-0.045***	**0.036**	**-0.011**
	(0.077)	(0.026)	(0.063)	(0.106)
	[0.703]	*[0.277]*	*[0.822]*	*[0.921]*
T3: Combined	**0.129***	**-0.027**	**0.010**	**0.060**
	(0.068)	(0.024)	(0.054)	(0.095)
	[0.208]	*[0.584]*	*[0.792]*	*[0.762]*
Mean dep. variable (control)	0.000	0.139	0.593	-0.000
R-squared	0.046	0.385	0.120	0.094
Observations	1937	123	4628	43266
T1 = T2 (F p-val)	0.671	0.519	0.056	0.488
T1 = T3 (F p-val)	0.830	0.951	0.085	0.895
T2 = T3 (F p-val)	0.544	0.405	0.635	0.485
T1 + T2 = T3 (F p-val)	0.518	0.177	0.599	0.879
Joint F-stat (p-val)	0.208	0.391	0.190	0.825

Note: Estimates based on OLS regressions as specified in section 5. * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors reported in parenthesis. These are clustered at the level of the school when employing observations at a lower level. P-values adjusted for multiple hypothesis testing grouped by rows are presented in brackets. The regressions include full controls, namely block and municipality dummies and school controls. In column (1) we also include parent controls. In column (4) we include grade and test type controls. School controls are number of teachers, number of classrooms, and number of students. Parent controls are parent gender, whether the parent has completed primary school, whether the parent has a partner, and number of children; they also include the age of the student, his/her gender, grade and relation to respondent. The dependent variable in columns (1) and (4) are z-score indices. The dependent variable in column (2) is share of students that repeated a grade. The dependent variable in column (3) is the share of students that were present during the first endline data collection visit. All dependent variables are fully described in Table A7 in Appendix.