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Does Parental Involvement Improve Learning?

Evidence from Angolan primary-schools

Dina Raquel Gonçalves Rodrigues

Matriculation Number 33063

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Professor Pedro C. Vicente

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Dina Rodrigues

Abstract

This study examines conditional correlations between different types of parental involvement, namely, support of education at home and formal participation at school, and children's test performance. We use survey data and standardized tests conducted in 126 primary schools in Kwanza-Sul, Angola. We report positive and significant correlations for involvement at home, and negative and significant correlations for formal involvement, although coefficients are larger and stronger for the former. In addition, we find that the relationship between formal participation and test performance is shaped by school quality, as negative correlations found in benchmark specifications are exclusive to involvement in lower-performing schools.

Keywords: Parental Involvement, Learning Outcomes, Test Scores, Primary Schools, Education, Angola

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1. Introduction

Access to education has expanded significantly in developing countries, mirroring priority-areas acted upon by governments and development partners in the past couple of decades. However, schooling differs from learning, and progress in the quality and delivery of education has been slower. In Tanzania and Uganda, more than 25% of students enrolled in the fifth grade are unable to recognize simple written words (Jones et al., 2014).[1] In Angola, a recent comprehensive survey finds that 40% of children aged 8 to 11 are attending a grade that is at least two years behind the correct grade for their age, either due to late enrolment or grade repetition.[2]

Researchers, policy-makers, and practitioners have long recognized the central role of parents in shaping children's educational progress. Parents can take ownership of the learning process in a variety of ways, as engagement can start in the household and extend to schools and communities. However, in developing countries, particularly in deprived rural settings, parents might lack the capacity, resources, or incentives to support their children's education. In Angola, poverty is rampant, and the adult literacy rate is currently at 65.6%, decreasing to 41% in rural areas.[3] Poor uneducated parents face many competing demands that drain their time and resources, and without recognizing the immediate value in supporting their children's education, this endeavour might be understood as less important than work, home production, or leisure. Thus, policy options for today's uneducated children, living with today's uneducated parents, are not straightforward (Banerji, Berry, and Shotland, 2017).

A growing subset of the literature in education and development economics explores whether and how parents can improve learning. There is limited evidence of educational gains

[1] 2012 *Uwezo Initiative* data. The *Uwezo Initiative* monitors basic literacy and numeracy levels of primary and secondary-school-aged children across at least half of the districts in Kenya, Tanzania and Uganda through comprehensive household surveys.
[2] UNICEF and INE, "Childhood in Angola: A Multidimensional Analysis of Child Poverty", 2018.
[3] INE, Definitive results on the 2014 Census.

from good parenting practices when it comes to deprived settings, given all of parents' constraints (i.e.: Andrabi, Das, and Khwaja, 2012; Banerji, Berry, and Shotland, 2017). On the other hand, in recent decades there has been widespread enthusiasm for programmes that aim to improve learning by formally including parents in schools' decision-making processes. Nevertheless, as programmes vary significantly in design, degree of parental involvement, and context, the literature presents mixed results (see Barrera-Osorio et al., 2009, or Glewwe, Galiani, and Perez-Truglia, 2015, for a review).

Our work contributes to this topic by examining conditional correlations between different types of parental involvement and children's learning, as measured by standardized testing. We mainly consider parental support of education at home and formal participation at school. We take a non-experimental approach and use micro-level data collected in the province of Kwanza-Sul, one of the poorest in Angola, where approximately 63% of primary-school-aged children are educationally deprived.[2] We start by running benchmark OLS regressions using involvement indices as our main regressor of interest. Moreover, we conduct a heterogeneous analysis to assess whether other educational inputs shape the relationship between parental involvement and children's learning. We do this for parental education and school quality, as proxied by the school's relative performance in standardized tests. Lastly, to address endogeneity in the parental involvement decision we attempt an Instrumental Variable approach, although we suffer from low first-stage explanatory power.

We find that, on average, involvement at home is positively and significantly correlated with test performance, whereas formal involvement is negatively and significantly correlated with test results in our sample. The first relationship is larger in magnitude and significance. We report no consistent evidence for heterogeneous effects in terms of parental education. However, we find that the relationship between formal participation and test results is strongly shaped by school performance, as the average negative correlation found in benchmark

specifications is exclusive to participation in lower-performing schools. We hypothesize that parents might find it difficult to identify priorities, or unintendedly contribute to the dispersion of attention and resources, in schools with many pressing necessities. In addition, parents might be more constrained to effectively hold teachers and directors accountable in lower-quality schools. Nevertheless, we cannot exclude the possibility that negative estimates for formal participation are explained by selection bias, as parents of students with poor academic track records, or low ability, might be more motivated to be formally involved. Negative self-selection would also apply at the school level and could be disproportionately present in lower-performing schools, hence possibly explaining our heterogeneous findings as well.

The remainder of this paper is organized as follows. In Section 2, we conduct a literature review. In Section 3, we briefly present the Angolan context. In Section 4, we discuss data and measurement. In Section 5, we present our empirical strategy. In Section 6, we report and analyse results. In Section 7, we discuss one of our main limitations. Finally, in Section 8, we present concluding remarks.

2. Literature Review

Literature in education and economics has long recognized the central role of parents in shaping their children's educational progress. Some research in economics attempts to quantify the importance of parental inputs in the formation of children's cognitive and non-cognitive skills through structural models (Todd and Wolpin, 2007; Cunha and Heckman, 2007; Cunha, Heckman, and Schennach, 2010). Following the *"experimental revolution"*, a growing literature sheds light on the "*black box*" of parental inputs in the education production function, aiming to understand how sensible policies can increase parents' commitment to action when it comes to their children's education, and quantify gains in learning. Our work relates to several strands of this literature, one focusing on parental support of education at home, another on parents' individual participation and collective action in schools.

When it comes to developing countries, with lower levels of adult literacy, there is limited evidence on how parents can support education outside schools, and how much their children will benefit (i.e.: Kagitcibasi, Sunar, and Bekman, 2001; Banerjee et al., 2010; Andrabi, Das, and Khwaja, 2012; Banerji, Berry, and Shotland, 2017; Di Maro et al., 2020). In rural India, Banerjee et al. (2010) find that when volunteers are trained to hold after-school remedial reading camps, parents and community members mobilize to teach, resulting in significant improvements in children's reading skills. In the same context, Banerji, Berry, and Shotland (2017) evaluate a programme where mothers receive daily literacy classes, training and materials to increase involvement in their children's education at home, or both, finding that all treatments improve maternal literacy and education support, generating positive spillovers in children's test scores. In Angola, Di Maro et al. (2020) provide evidence that supplying parents with information on the performance of local schools, relative to others in the province, and on good parenting practices, significantly improves parental involvement in education at home, although this does not translate into improved learning, as measured by standardized testing.

In addition, our work relates to the growing literature on formal parental participation. In recent decades, several developing countries have implemented School-Based Management (SBM) policies aimed at empowering local stakeholders, often focusing on parents, to actively engage in school decision-making via some type of Committee. These policies aim at increasing the authority and accountability of local participants over school performance, and ultimately learning (see Barrera-Osorio et al., 2009, or Glewwe, Galiani, and Perez-Truglia, 2015, for a review). Given the endless design possibilities of participatory programmes, and the importance of local context, the literature presents mixed results.

Some programmes lead to improvements in learning (i.e.: Gertler, Patrinos, and Rubio-Codina, 2012; Barr et al., 2012; Pradhan et al., 2014; Duflo, Dupas, and Kremer, 2015; Andrabi, Das, and Khwaja, 2017). In Kenya, Duflo, Dupas, and Kremer (2015) find that when parents in

School Councils are given funds to hire short-term supplementary teachers, and trained to monitor them, school governance and standardized test scores improve in their sample. Pradhan et al. (2014) provide evidence that when parents are democratically elected to School Committees, and establish linkages with local governing authorities in Indonesia, this increases parental involvement and contributions to schools, leading to improved student performance. Andrabi, Das, and Khwaja (2017) find that providing parents with report cards on the relative performance of local schools, and their children, results in parents taking students out of lower-performing schools, improving average test scores for their sample of Pakistani children. Similarly, in Uganda, Barr et al. (2012) find that when School Committees determine objectives and progress indicators to be included on performance report cards disclosed to parents, student and teacher absenteeism decrease, and student performance improves.

Contrary to this, another strand of the literature reports null or heterogeneous impacts on learning (i.e.: Galiani and Schargrodsky, 2005; Galiani, Gertler, and Schargrodsky, 2008; Banerjee et al., 2010; Hanushek, Link, and Woessmann, 2013; Blimpo, Evans, and Lahire, 2015; Beasley and Huillery, 2017; Di Maro et al., 2020). Blimpo, Evans, and Lahire (2015) find that the effect of an SBM reform in the Gambia, consisting of grants and large-scale capacity building of School Committees, is strongly shaped by parental human capital. In villages where adult literacy rates were greater than 45%, the policy improved test scores, but in villages where literacy was sufficiently lower, test results decreased. Beasley and Huillery (2017) evaluate a similar grant and training programme in Niger, finding that, surprisingly, Committees where a majority of parents are educated focus grant disbursement on *lumpy* infrastructure investments, in detriment of more beneficial spending, such as pupil educational support, preferred by Committees composed mainly by uneducated parents. Thus, grants and training of parents negatively impacted test scores in the first group and had null effects in the second. In Argentina, Galiani and Schargrodsky (2005) find that the effect of early-90s school

decentralization policies is mediated by local governmental capacity, proxied by provincial fiscal deficits: whilst in low-deficit areas, decentralization increased test scores, in high-deficit areas, test scores decreased. Evaluating the same policies, Galiani, Gertler, and Schargrodsky (2008) conclude that *"decentralization helped the good get better, but left the poor behind"*, as school autonomy increased student performance in wealthier communities, but had null effects in poor communities.

Our work contributes particularly to the literature on heterogeneity, both when it comes to parental engagement at home and via formal channels, as we test whether parental education and school quality are important mediators of the conditional correlations between parents' involvement and children's learning. This is particularly relevant in the Angolan context, as low adult literacy and education levels, along with lower school quality, may hinder parents' well-intentioned attempts to engage in children's education.

3. Country context: Angola

Angola, a country on the west coast of Southern Africa, with 30.8 million inhabitants and a GDP per capita, in PPP, of 6452 international USD,[4] is, unfortunately, an often-cited example of the resource curse, as despite large revenues from oil and other extractive industries, the general environment of weak and notoriously corrupt institutions[5] has hindered sustained improvements in priority development areas. Thus, almost two decades following the end of a devastating civil war, the country struggles with an agonizing 51% multidimensional poverty rate,[6] and poor quality of health and education services, ranking 149th out of 189 countries in the 2019 Human Development Index.

[4] World Bank, World Development Indicators, 2018.
[5] Transparency International's Corruption Perception Index 2019 ranks Angola as the 37th most corrupt out of 183 countries.
[6] UNDP, Human Development Index, 2019.

When it comes to its education system, children in Angola should start pre-school at age 5 and complete mandatory primary schooling between ages 6 to 11. However, universal access to primary education is still not guaranteed, as the adjusted net enrolment rate in the first grade of primary schooling was 65.16% in 2016.[7] Furthermore, a recent representative survey finds that only 44% of children aged 12-17 have completed primary school.[2] Finally, parents in Angola might lack the capacity to support their children's education, as the adult literacy rate currently stands at 65.6%, decreasing to 41% in rural areas.[3]

Our work uses data from a sample of schools in Kwanza-Sul, the fifth most populated province and one of the poorest amongst all 18 provinces. The demographic structure in Kwanza-Sul is very young, with approximately 50% of its 1.8 million inhabitants being children aged 0-14.[8] When it comes to education, the province faces several problems, including an adult literacy rate of 55%, below the national average, and a worryingly low primary-school attendance rate of 27%, as per UNICEF.[2] In addition, school inputs are likely lacking, as despite being the fifth most populous province, with young children accounting for half of its demographic breakdown, Kwanza-Sul ranks eight in terms of primary school and teachers endowment, and seventh in terms of primary-school classrooms.[9]

4. Data and Measurement

4.1. Data Source

We use endline data collected in a field experiment on community-driven monitoring, implemented in 126 primary schools, across nine municipalities, in the province of Kwanza-Sul (Di Maro et al., 2020). This randomized control trial (RCT) was implemented by *Fundo de Apoio Social*, a governmental institution, and the endline data collection took place between

[7] UNESCO Institute of Statistics, 2016 data.
[8] INE, Definitive results on the 2014 Census for the Kwanza-Sul Province.
[9] INE, Social Statistics 2011-2016. Most recent available data. As of 2013, Kwanza-Sul had 477 primary schools and 6171 primary teachers. As of 2016, the province had 4423 classrooms in all its primary schools.

July-December 2018. Schools were randomly allocated across four comparable groups, namely, a control and three treatment groups. The first treatment consisted of household visits in which parents received information on the performance of local schools, relative to others in the province, and on parenting practices beneficial to education. In the second treatment, parents were invited to gather in meetings, where school problems and action-plans to overcome them were discussed. The third treatment combined the first two.

At endline, standardized tests were applied for students of the 3rd, 4th and 5th grades, in the disciplines of Mathematics and Portuguese language. Tests were conducted during student's regular classes and were scored on a scale of 0-10 by the evaluating team. Additionally, the parents of 40 randomly selected students per school were invited for interviews. A total of 1977 parents came to school and answered the questionnaires. One limitation of our dataset is that we cannot match students, or parents, at baseline and endline. Thus, we use individual test scores for students whose parents were interviewed at endline as our main outcome of interest. We conduct our analysis using test scores on both Maths and Portuguese, and across all grades.[10] However, as some of the randomly selected students were absent from school when tests took place, we have 3086 tests with matched parents, less than two tests per student. It also occurred that some classes took only one test, between Maths and Portuguese.

From the parent surveys, we use self-reported measures of individual engagement with their children's education. Our main indicators are of involvement at home and within formal channels at the school level. We also consider supplemental measures such as parent-teacher engagement and parent-community engagement. Other relevant variables from the parent's surveys are socio-economic controls (i.e.: marital status; number of dependent children;

[10] We perform separate analysis for Maths and Portuguese tests, but the reduction in sample size impacts estimation power. Thus, we only show estimations that include both test types, mentioning results across disciplines when deemed relevant.

educational attainment; selected student's age and gender).[11] Finally, we use school administrative data from 2018 to create a set of basic school controls (i.e.: number of teachers; number of classrooms; access to water and electricity).

4.2. Descriptive Statistics

The average standardized test score for Maths and Portuguese across all grades, for students whose parents were interviewed at endline, is 5.63 points (on a scale of 1-10), with the average score not differing significantly across disciplines (*Table 1*). Tested students are 11 years old, on average, and evenly split across genders. Most respondents are the actual parents of selected students, but 21% of the parent surveys were taken by other family members, such as brothers, aunts, and grandparents. Surveyed parents are, on average, 40 years old, and 49% female. The majority reports having a partner and, on average, 6 dependent children. 59% of sampled parents have completed primary school or acquired further education.

Schools in our sample have, on average, 20 teachers and 716 students, which yields a pupil-to-teacher ratio of approximately 36. Whilst 86% of schools have at least one toilet, basic infrastructure is far from assured, as only 26% of schools have access to water and only 38% have electricity. The average number of classrooms is 7, which given the average number of students, might mean crowded classrooms or lessons taken outside due to lack of infrastructure.

When it comes to measures of involvement at home, parents report often keeping clear rules and a regular sleep schedule for their children, but, on average, have only helped them with homework 3 times in the past two weeks. Family meals have occurred 5 times in 14 past days. Regarding formal participation, 17% of parents are elected-members of Parent Committees, and our sample reports having attended general school meetings once per semester, in the past

[11] Teachers, directors, and other school board members were also interviewed at endline. We do not use school-reported measures of formal involvement because most measures analogous to those reported by parents are aggregated at the school level, so they would not be fit to estimate a relationship between each parent's involvement and their child's performance on standardized tests. Similarly, comparable measures of parent-teacher engagement reported by teachers are mostly at the class-level.

school year. Only 5% of parents have placed a suggestion or complaint regarding the education services of the municipality within the past two years.

Table 1: Descriptive Statistics

	N	Mean	St. Dev	Min	Max
Students					
Age	1973	11.299	2.078	5	19
Female	1977	.493	.5	0	1
Test Score	3086	5.628	2.754	0	10
Test Score PT	1553	5.626	2.872	0	10
Test Score MAT	1533	5.631	2.63	0	10
Parents					
Respondent is student parent	1976	.79	.407	0	1
Age	1969	39.865	11.261	18	83
Female	1977	.489	.5	0	1
Has partner	1975	.563	.496	0	1
No. dependent children	1977	6.159	3.13	1	35
Completed Primary school	1976	.59	.492	0	1
Parental involvement at Home [1]					
Freq. keeping clear rules at home	1944	2.779	.924	0	4
Freq. keeping regular sleep schedule	1949	2.719	1.029	0	4
No. times helping with homework	1813	3.388	3.756	0	14
No. times having family meals	1860	5.363	5.237	0	14
Formal parental involvement [1]					
Parent is member of Parent Committee	1230	.172	.378	0	1
Freq. attending General School meetings	1914	2.472	1.733	0	7
Placed education suggestions/complaints	1976	.054	.226	0	1
School					
Total no. Students	123	715.886	544.753	43	2782
Total no. Teachers	123	20.415	34.526	0	236
Total no. Classrooms	123	6.789	6.639	0	53
Has at least one Bathroom	126	.857	.351	0	1
Has access to Water	123	.26	.441	0	1
Has Electricity	123	.39	.49	0	1

Note: [1] A comprehensive listing of survey questions used in involvement indices is included in the annex (*Table A4*).

5. Empirical Strategy

In this section, we describe the empirical strategy employed to estimate conditional correlations between parental involvement and standardized test scores. Our benchmark OLS specification is as follows:

$$Y_{sijk} = \beta_0 + \beta_1 PI_{ijk} + \gamma X_{ijk} + \delta S_{jk} + \eta M_k + \theta T_s + \varepsilon_{ijk} \qquad (1)$$

where Y_{sijk} is our outcome of interest, the standardized test score *s* for student *i* in school *j* and municipality *k*; PI_{ijk} is an index of parental involvement for parent *i* in school *j* and municipality *k*; X_{ijk} is a vector of parent and student demographic controls; S_{jk} is a vector of school controls; M_k is a vector of eight municipality dummies, and T_s is a vector of dummies for the standardized

test discipline and grade. Residuals are robust and clustered at the school level, the level of randomization in the field experiment. Additional specifications include school fixed effects, comparing students within the same school, or class fixed effects, comparing students of the same cohort, as in Avvisati et al. (2014).

Our coefficient of interest is β_1, which estimates the conditional correlation between each parent's involvement and their child's standardized test performance. We expect this relationship to be positive, yet as we consider different types of involvement, the magnitude and significance of the coefficient will vary. Since parent surveys provide several measures for the same type of involvement, we build one aggregated index per involvement type, as in Beasley and Huillery (2017) and Di Maro et al. (2020). This aggregation increases statistical power to detect correlations that go in the same direction within a domain and ensures that β_1 coefficients are comparable for different types of involvement.

Our main analysis includes two indices. In the Involvement at Home Index, we consider three survey measures: the frequency of keeping clear rules, the frequency of keeping a regular sleep schedule for the child, how many times parents helped with homework, and the number of family meals in the past two weeks. We orient scales such that higher scores mean higher involvement and take z-scores of each variable. The aggregate Involvement at Home Index is an equally-weighted average of the z-scores of its components. In the Formal Involvement Index, we aggregate three survey measures: whether the parent is a member of the Parents Committee, the frequency of attending general school meetings in the past school-year, and whether the parent has placed a suggestion or complaint related to the municipality education services in the past two years. We also consider two supplementary indices, namely Parent-Teacher Engagement and Parent-Community Engagement. [12]

[12] A comprehensive listing of survey questions used to build involvement indices is included on *Table A4*, in the annex.

6. Results

6.1. Benchmark OLS

In this section, we report and analyse benchmark OLS estimates for the conditional correlations between parental involvement and children's standardized test performance. *Table 2* reports estimates as specified in section 5, including controls for parent and student characteristics as well as standardized test grade and discipline. *Panel A* reports coefficients for the Involvement at Home index and *Panel B* reports coefficients for the Formal Involvement index. Additional controls are added gradually, with eight municipality dummies included in columns (2) and (3), controls for school characteristics included in column (3), school fixed effects included in column (4) and class fixed effects included in column (5).

Table 2: OLS estimates for Parental Involvement

	Test scores (MAT and PT; grades 3, 4 and 5)				
	(1)	(2)	(3)	(4)	(5)
Panel A					
Parental Involvement at Home	**0.362*** **	**0.327*** **	**0.265*** **	**0.130**	**0.113**
	(0.108)	(0.101)	(0.101)	(0.099)	(0.120)
School FE	No	No	No	Yes	No
Class FE	No	No	No	No	Yes
R-squared	0.086	0.115	0.150	0.278	0.510
R-squared adj.	0.082	0.109	0.142	0.244	0.376
Observations	3056	3056	2986	3056	3056
Panel B					
Formal Parental Involvement	**-0.200****	**-0.182****	**-0.126**	**-0.114**	**-0.136**
	(0.093)	(0.092)	(0.086)	(0.080)	(0.113)
School FE	No	No	No	Yes	No
Class FE	No	No	No	No	Yes
R-squared	0.080	0.110	0.147	0.279	0.510
R-squared adj.	0.076	0.104	0.139	0.245	0.376
Observations	3064	3064	2994	3064	3064

Note: OLS estimates as specified in Section 5. Robust standard errors clustered at the school-level in parentheses.
* significant at 10%, ** significant at 5%, *** significant at 1%. *Panel A* reports coefficients for the index of Parental Involvement at Home (frequency of helping with homework; having family meals; keeping clear rules; keeping a regular sleep schedule for the student). *Panel B* reports coefficients for the index of Formal Parental Involvement (being a member of the Parents Committee; frequency of attending general school meetings; having placed a suggestion or complaint regarding municipality education services). All regressions include Parent controls, Student controls, grade and test discipline controls. In columns (2) and (3) Municipality dummies are included. In column (3) School controls are included. Column (4) includes School fixed effects. Column (5) includes Class fixed effects. Parent controls consist of whether the respondent is the student's parent; his age; gender; whether he has a partner; number of dependent children; and whether he has completed primary school. Student controls consist of age and gender. School controls include the total number of students; total number of teachers; number of classrooms and dummies if the school has at least one bathroom; if it has electricity; and if it has access to water (respectively).

Estimates on *Panel A* suggest that, as expected, higher involvement at home is positively and significantly correlated with higher standardized test scores across both disciplines and all grades.[13] In our simplest specification, the coefficient of interest is 0.36 and statistically different from zero at a 1% level. A one standard deviation increase in our involvement at home index is associated with a 0.36-point increase, on a scale of 1-10, in standardized test results. Once municipality dummies and school controls are included, the magnitude of the coefficient does not change by much and its significance is unaltered. However, once we include school or class fixed effects (columns 4 and 5), the magnitude of the coefficient drops by more than half, and it is no longer significant. Hence, the significant correlations in columns (1)-(3) are driven by variability between rather than within schools. Whilst the parents of 40 randomly selected students were invited for interviews, on average only 16 parents were interviewed per school. Our parent sample is likely too small and fairly homogeneous within schools, so there might not be enough variation to detect significant correlations between involvement at home and test scores at this level.

When it comes to formal involvement, estimates on *Panel B* suggest that, contrary to our expectations, higher formal participation is associated with lower test results across all grades and disciplines.[14,15] In our simplest specification, the coefficient of interest is -0.2 and statistically different from zero at a 5% significance level. A one standard deviation increase in our formal involvement index is associated with a 0.2-point decrease, on a scale of 1-10, in standardized test scores. However, once we control for school characteristics (column 3), the coefficient is no longer significant. When we include school or class fixed effects (columns 4

[13] We conduct separate analysis for Portuguese and Maths, finding that although the magnitude of coefficients is slightly larger for Portuguese tests, effects are not statistically different across disciplines.
[14] Separate analysis for both disciplines shows that coefficients are only significant for Maths. For Portuguese tests, coefficients are still negative, albeit slightly smaller and thus not significant.
[15] We run regressions before aggregating indicators into indices, finding that all three survey measures of formal participation are negatively correlated with test scores. One might wonder if the negative direction of the correlation could be entirely due to the suggestions/complaints dummy, however, disaggregated results show similar coefficients for members of Parent Committees and for parents who have placed a suggestion/complaint.

and 5), coefficients are similar in magnitude to those in the specification with school controls, and still not significant. As in *Panel A*, significant correlations are driven by variability between rather than within schools. Nevertheless, unlike in the case of involvement at home, we suspect that there is some variation in formal participation within schools (i.e., some parents are members of Parent Committees), but that certain school characteristics make this type of involvement ineffective. Finally, comparing both involvement types, the magnitudes and significance of coefficients are larger for involvement at home than for formal participation.

The negative correlations observed in *Panel B* are surprising and worth discussing, so we illustrate *possible mechanisms* of how higher parental participation via formal channels can translate into lower test performance. Firstly, our coefficients could be capturing negative self-selection on unobservables. There might be students who, despite struggling with learning, continue to attend classes and took standardized tests because their parents are highly engaged at school. In addition, parents of students with low academic ability might be more motivated to be formally involved.[16] If this is the case, our estimates would be biased downwards. This explanation resonates with Miguel and Kremer's (2004) finding that a deworming intervention in Kenya increased school participation, but did not improve test scores, as "low-ability" students might have disproportionately self-selected into the programme. To mitigate selection bias in our estimations, it would be useful to control for student's past test performance. However, this is not possible due to dataset limitations.

A second hypothesis is that if the two involvement types are substitutes, and parents optimally adjust individual educational inputs, then they might see formal participation as a sufficient contribution to their children's education, decreasing support at home. Since we find positive and significant correlations on *Panel A*, if parents substitute away from involvement at

[16] We are not stating that our regressions suffer from simultaneity. Our involvement measures mostly refer to participation in the past school year, so standardized tests took place after involvement decisions were made. Instead, negative self-selection would be tied to omitted variable bias (i.e. student ability).

home, that could explain the negative correlations on *Panel B*. Although not exactly similar, some literature provides evidence for parents adjusting individual efforts in response to higher school inputs. Pop-Eleches and Urquiola (2013) find that when children are admitted to higher-quality secondary schools in Romania, parents adjust efforts at home, spending less time helping with homework. Das et al. (2013) find that when school grants are anticipated by households in rural India, parents reduce educational spending, offsetting the positive impact of grants on tests. However, we consider it unlikely that parents in our sample are substituting away from involvement at home, as conditional correlations between the two involvement types are positive and significant, albeit quite small (see *Table A1*, in the annex).

On the other hand, given that the significant correlations for formal participation come from variability between schools, hypotheses related to how parent's participation affects performance at the school level might also be of use. Following results in Blimpo, Evans, and Lahire (2015), one such hypothesis is that if parental human capital is sufficiently low, increased participation in Parent Committees or general school meetings can unintendedly lead to poorer school decision-making, which can be conducive to decreased learning outcomes. We conduct a heterogeneous analysis by parent's education level in section 6.2.

Finally, some schools might have particular characteristics that make formal parental participation counterproductive to learning. In lower-quality, poorly managed schools, parents might find it difficult to effectively hold teachers and directors accountable, and contribute to better school governance, even if they intend to. Parents might also have a hard time deciding on priorities in schools with a wide array of problems, and unintendedly contribute to the dispersion of attention and resources across several issues, or focus on matters less beneficial to learning, as in Beasley and Huillery (2017). We conduct a heterogeneous analysis considering school performance in section 6.3. Note that selection biases previously discussed

would also apply at the school level, and could be stronger for lower-quality schools, thus explaining any heterogeneity we might find.

6.2. Heterogeneous estimates by Parental Education

As previously mentioned, a strand of the literature highlights how parents' education and capacities can shape the direction and magnitude of the effect of parental involvement on learning outcomes, particularly when it comes to formal types of participation (Blimpo, Evans, and Lahire, 2015; Beasley and Huillery, 2017). Blimpo, Evans, and Lahire find that grants and training to School Committees in the Gambia positively impacted test results in villages with adult literacy rates greater than 45%, but negatively impacted tests in villages with sufficiently lower literacy rates. It is feasible that less-educated parents in our sample are less able to take advantage of Parent Committees, or general school meetings, to raise awareness on pressing educational concerns, voice their preferences, and influence school decision-making in a way that is conducive to improved learning. Thus, we test the hypothesis that uneducated parents might amplify the negative correlation for formal participation found in section 6.1.

Similarly, Andrabi, Das, and Khwaja (2012) find that Pakistani mothers with some formal education dedicate significantly more time to assist their children with schoolwork, generating positive spillovers on children's test performance. It is feasible that less-educated parents in our sample are less equipped to support their children at home, keeping clear rules and healthy habits, or helping them with homework. Hence, having uneducated parents might reduce the positive correlation for participation at home found in section 6.1.

Heterogeneous estimates by parental education are presented in *Table 3*. Presentation and specifications are the same as in *Table 2*, with the addition that to detect heterogeneity, we include an interaction term between each involvement index and a dummy for parents who did not complete primary schooling. The interaction coefficient measures how the correlation

between involvement and test scores is amplified or reduced for uneducated parents. We also include the p-value for the F-statistic of the total conditional correlation between parental involvement and test scores, that is, the sum of the parental involvement coefficient with the interaction coefficient.

Table 3: Heterogeneous estimates by Parental Education

	Test scores (MAT and PT; grades 3, 4 and 5)				
	(1)	(2)	(3)	(4)	(5)
Panel A					
Parental Involvement at Home	**0.473*** **	**0.365*** **	**0.308** **	**0.134**	**0.175**
	(0.145)	(0.134)	(0.134)	(0.139)	(0.169)
Uneducated parent	**-0.805*** **	**-0.706*** **	**-0.369** **	**-0.003**	**-0.050**
	(0.156)	(0.149)	(0.151)	(0.132)	(0.166)
Inv. at Home x Uneducated parent	**-0.243**	**-0.083**	**-0.094**	**-0.008**	**-0.114**
	(0.200)	(0.187)	(0.197)	(0.191)	(0.224)
School FE	No	No	No	Yes	No
Class FE	No	No	No	No	Yes
R-squared	0.086	0.115	0.150	0.278	0.510
R-squared adj.	0.082	0.109	0.142	0.243	0.376
Observations	3056	3056	2986	3056	3056
Inv. Home + Inv. Home x Uneduc = 0 (F-stat p-value)	0.115	0.047	0.149	0.354	0.701
Panel B					
Formal Parental Involvement	**-0.228***	**-0.204***	**-0.125**	**-0.145**	**-0.198**
	(0.120)	(0.118)	(0.111)	(0.111)	(0.151)
Uneducated parent	**-0.888*** **	**-0.783*** **	**-0.419*** **	**-0.025**	**-0.063**
	(0.160)	(0.151)	(0.153)	(0.134)	(0.169)
Formal Inv. x Uneducated parent	**0.077**	**0.061**	**-0.004**	**0.085**	**0.159**
	(0.176)	(0.172)	(0.167)	(0.172)	(0.204)
School FE	No	No	No	Yes	No
Class FE	No	No	No	No	Yes
R-squared	0.080	0.110	0.147	0.279	0.510
R-squared adj.	0.076	0.104	0.139	0.245	0.376
Observations	3064	3064	2994	3064	3064
Formal Inv. + Formal Inv. x Uneduc = 0 (F-stat p-value)	0.261	0.281	0.318	0.623	0.793

Note: Robust standard errors clustered at the school-level in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%. Uneducated parent is a dummy variable equal to 1 for respondents who have not completed primary schooling. All regressions include Parent controls, Student controls, grade and test discipline controls. In columns (2) and (3) Municipality dummies are included. In column (3) School controls are included. Column (4) includes School fixed effects. Column (5) includes Class fixed effects. Refer to notes of *Table 2* for the definition of controls and main regressors used.

Panel A does not provide evidence that the correlation between involvement at home and test results is significantly reduced for uneducated parents, as interaction coefficients are never

significant, albeit negative. For educated parents, coefficients are higher than those found in benchmark specifications (*Table 1, Panel A)*. The F-statistic for the total conditional correlation between uneducated parents' involvement at home and test scores is still significant in specification (2). Thus, we find no consistent evidence for heterogeneity in terms of parental education, and there can still be learning gains when uneducated parents increase at-home support.

Likewise, when it comes to formal participation, *Panel B* provides no evidence that the correlation between formal involvement and test results is significantly lower for uneducated parents. Interaction coefficients are close to zero and never significant, albeit surprisingly positive. For educated parents, formal involvement coefficients are negative and significant in specifications (1) and (2), and very similar in magnitude to those in benchmark estimations (*Table 1, Panel B)*. Hence, we find no evidence that the negative correlation between formal participation and test performance is coming from counterproductive participation of uneducated parents.

6.3. Heterogeneous estimates by School Performance

Some literature, particularly evaluations of school autonomy policies, show that the quality and capacity of local institutions can shape the effect of formal parental involvement on learning outcomes (Galiani, Gertler, and Schargrodsky, 2008; Hanushek, Link, and Woessmann, 2013; Glewwe, Galiani, and Perez-Truglia, 2015). School quality is likely a particularly significant mediator. In lower-quality schools, riddled with a plethora of issues, parents might be more constrained to effectively contribute to school governance and oversight. They might also find it more difficult to decide and act on priorities, given many pressing problems, and focus on matters less beneficial to learning (Beasley and Huillery, 2017), or unintendedly contribute to the dispersion of attention and resources across several issues.

We take the school's relative performance in standardized tests as a proxy for overall quality and test the hypothesis that the negative correlation for formal participation found in section 6.1 is mitigated when children attend top-performing schools.[17]

When it comes to involvement at home, it is also feasible that the efficacy of parental efforts might be amplified when students attend better schools and mitigated when they attend lower-quality schools. Thus, we test the hypothesis that the positive correlation between support at home and test scores found in section 6.1 is amplified when children attend top-performing schools.

Heterogeneous estimates by school performance are presented in *Table 4*. Specifications and general presentation are the same as in previous tables. We measure school performance by computing the school's average z-score for standardized test results in Maths and Portuguese, across all grades.[18] All schools were then ranked according to their mean score. To detect heterogeneity, we include an interaction term between parental involvement and a dummy for schools in the top tercile of the school performance ranking. The interaction coefficient measures how the correlation between involvement and test scores is amplified or reduced when children attend top schools. We also include the p-value for the F-statistic of the total conditional correlation between participation and test scores, that is, the sum of the coefficient for parental involvement with the interaction coefficient.

Panel A does not provide evidence that students who attend schools on the top tercile of our ranking benefit relatively more from parental support at home than students who attend lower-performing schools, as interaction coefficients are never significant. As evidenced by the F-

[17] Recall that in benchmark estimations, we do not find a significant correlation between formal participation and test scores once we control for school characteristics. This section is also pertinent to understand this result.
[18] To clarify: since we have six test types, we compute six z-scores per school. That is, in the first school we take 3rd grade Maths results, demean the variable and divide it by the sample standard deviation in 3rd grade Maths, then move on to 3rd grade Portuguese, so on and so forth. We then compute the school score by taking an equally-weighted average of z-scores across the six test types.

statistics p-values, the total correlation between involvement at home and test results for students who attend top-performing schools is positive and significant in specifications (1) and (2), and the magnitude of this correlation is similar to benchmark estimates (*Table 1, Panel A)*. Overall, it appears that the significant correlations in *Table 1, Panel A*, are *split* once we distinguish schools in terms of performance.

Table 4: Heterogeneous estimates by School Performance

	Test scores (MAT and PT; grades 3, 4 and 5)			
	(1)	(2)	(3)	(4)
Panel A				
Parental Involvement at Home	**0.172**	**0.166**	**0.172**	**0.071**
	(0.114)	(0.110)	(0.112)	(0.112)
Top performing school	**1.769*** **	**1.662*** **	**1.492*** **	**2.509*** **
	(0.154)	(0.162)	(0.163)	(0.076)
Inv. at Home x top performing school	**0.155**	**0.148**	**0.099**	**0.166**
	(0.199)	(0.201)	(0.210)	(0.227)
School FE	No	No	No	Yes
R-squared	0.174	0.184	0.195	0.278
R-squared adj.	0.170	0.178	0.188	0.244
Observations	3056	3056	2986	3056
Inv. Home + Inv. Home x Top school = 0 (F-stat p-value)	0.048	0.065	0.133	0.229
Panel B				
Formal Parental Involvement	**-0.285*** **	**-0.274*** **	**-0.258*** **	**-0.234*** **
	(0.093)	(0.094)	(0.093)	(0.087)
Top performing school	**1.819*** **	**1.713*** **	**1.534*** **	**2.606*** **
	(0.156)	(0.164)	(0.162)	(0.065)
Formal Inv. x top performing school	**0.398** **	**0.379** **	**0.392** **	**0.368** **
	(0.173)	(0.174)	(0.169)	(0.172)
School FE	No	No	No	Yes
R-squared	0.173	0.184	0.196	0.280
R-squared adj.	0.170	0.178	0.188	0.246
Observations	3064	3064	2994	3064
Formal Inv. + Formal Inv. x Top school = 0 (F-stat p-value)	0.449	0.489	0.352	0.382

Note: Robust standard errors clustered at the school-level in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%. School performance is measured by the average z-score of standardized test results in Maths and Portuguese across all grades. All schools were then ranked according to their mean z-score. Top performing school is a dummy equal to 1 if the school is in the highest tercile of the test results ranking. All regressions include Parent controls, Student controls, grade and test discipline controls. In columns (2) and (3) Municipality dummies are included. In column (3) School controls are included. Column (4) includes School fixed effects. Refer to notes of *Table 2* for the definition of controls and main regressors used.

On the other hand, *Panel B* provides evidence that the correlation between formal participation and test results is strongly mediated by school quality. When students attend

schools in the middle-or-lower tercile of our school ranking, parental participation is negatively and significantly correlated with test scores. Moreover, these coefficients are larger in magnitude and significance than benchmark estimates in *Table 1, Panel B*. However, the interaction term for formal participation in top-performing schools is positively and significantly correlated with test scores. Thus, when students attend a top-performing school, the total correlation between formal participation and test results is positive, albeit not significant, as evidenced by the F-statistic p-values. Hence, it is only in the lower-performing schools of our sample that formal parental involvement can be detrimental to learning.

6.4. Other measures of Parental Involvement

Table A2, in the annex, presents estimates for other measures of parental involvement, namely, Parent-Teacher Engagement and Parent-Community Engagement. In the former, we consider the frequency of interactions between parents and teachers, via the supply of information on the child's performance at school, and through parent-teacher meetings. In the latter, we consider the frequency of parents chatting amongst each other about school and their children, and whether respondents consider that parents in the community understand the benefits of education. *Table A2* presents evidence for positive and significant coefficients for both measures, but these are lower in magnitude and significance when compared to the correlations for involvement at home (*Table 1, Panel A*). Moreover, we consider that these are likely noisier measures of individual participation than our main indices, as they also reflect teachers' and other parents' attitudes and actions.

7. Further discussion

Whilst our specifications employ a wide range of controls and fixed effects at various levels, we would like to improve our identification strategy. Parental involvement is endogenously determined and there could be omitted variables, such as parent and student ability, or how each

parent values education, that explain both the decision to engage with their child's education and student's test performance. To address these concerns, we attempt an Instrumental Variable (IV) approach. We take advantage of the randomization of treatments designed to mobilize parents in the field experiment to instrument for the involvement decision. Di Maro et al. (2020) find that in treated schools parents increased involvement at home, contacts with teachers, and formal participation, but find no indirect impact on test results. Thus, we hypothesize that exposure to treatments can explain variations in our involvement indices, which are similar to those in Di Maro et al., and that it is plausible that treatments can only impact test scores via increased parental involvement.

Exposure to the information campaign is individually significant to instrument for involvement at home and engagement with teachers, one of our secondary measures. Exposure to other treatments employed in the RCT is not individually significant to explain any of our involvement indices. Unfortunately, as reported on *Table A3*, in the annex, when we instrument for involvement using the information treatment, first-stage F-statistics are too small to overcome critical values of the weak-instrument test, as per Stock and Yogo (2005). As weak instruments increase noise in the estimations, we cannot trust second-stage estimates.

Other tested instruments include the distance of parent's birthplace neighbourhood relative to the school, the distance of the household relative to the school,[19] how long the household has lived in the same neighbourhood and how long the household has lived in the school neighbourhood (for those that do). Our rationale was that fairly exogenous geographical variability could contain information on familiarity with local institutions, and thus explain variations in formal participation. However, the performance of these IVs was inferior to that of the information treatment.

[19] We find that the distance of the household relative to the school is not correlated with student absenteeism, so we considered that using it as an IV would not violate the exclusion restriction.

8. Concluding Remarks

This paper takes advantage of an extensive micro-level dataset for a sample of parents and primary-school students in the province of Kwanza-Sul, Angola, and uses a non-experimental approach to examine conditional correlations between two types of parental participation and children's learning, as measured by standardized test performance.

We find that, on average, involvement at home is positively and significantly correlated with test scores, whereas formal involvement at school is negatively and significantly correlated with test results, although the magnitude and significance of the first relationship is higher. We do not report consistent evidence for heterogeneity with regards to parent's education. However, we find that the relationship between formal participation and test results is strongly shaped by school quality, as the average negative correlation found in benchmark specifications is exclusive to parental participation in lower-performing schools. We hypothesize that parents might find it difficult to identify priorities, or unintendedly contribute to the dispersion of attention and resources, in schools with many pressing necessities. In addition, parents might be more constrained to effectively hold teachers and directors accountable in lower-performing schools. Nevertheless, we cannot exclude the possibility that negative estimates for formal participation are explained by self-selection, as parents of students with poor academic track records, or low ability, might be more motivated to be formally involved. Selection bias would also apply at the school level, and might be stronger in lower-quality schools, hence possibly explaining our heterogeneous findings as well.

We acknowledge that our analysis has several shortcomings. First, our identification strategy is not as robust as we hoped for, since attempts at an IV approach were mostly unsuccessful, hence we make no definitive causal assertions. Second, our dataset does not allow us to match parents and students at baseline and endline, so we can only conduct a static

analysis. Third, the use of self-reported measures of parental involvement comes with obvious limitations, although careful analysis of our data does not lead us to think parents are generally overstating their participation. Finally, we discuss *possible mechanisms* that explain negative correlations for formal participation but were unable to further elaborate.

This being said, one implication from our analysis is particularly uplifting, as we provide evidence that, regardless of how little, whatever parents can do to support education at home matters, as there are potential learning gains even when parents themselves are uneducated. This is particularly relevant to contexts where parents might lack the capacity to support their children's education, as is the case in Kwanza-Sul, where the adult literacy rate is 55%, decreasing to 43.4% in rural areas, or Angola more generally. Thus, programmes that build parents' capacities on this topic, giving them clear and direct instructions, such as setting schedules for playtime, schoolwork and sleep, how to monitor homework completion, and understanding symbols used by teachers to grade schoolwork, can be conducive to improved learning.

A second implication is a warning against *one-size-fits-all* participatory programmes, as formal parental involvement can be counterproductive in deprived areas, with lower quality schools, where students are already behind. It is important to ensure that participation comes with *real authority*, and that programmes train parents to *effectively* monitor school performance, particularly in schools where this is most difficult. Whilst lately, development practitioners and policy-makers have focused on formally including parents in schools, we would argue that it is important not to forget what parents, despite several constraints, can do for education at home.

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Annex

Table A1: Correlations between Formal Involvement and Involvement at Home

	Parental Involvement at Home		
Panel A	(1)	(2)	(3)
Formal Parental Involvement	**0.090*** **	**0.090*** **	**0.093*** **
	(0.024)	(0.025)	(0.025)
R-squared	0.048	0.057	0.062
R-squared adj.	0.044	0.051	0.056
Observations	3056	3056	2986
	Formal Parental Involvement		
Panel B	(1)	(2)	(3)
Parental Involvement at Home	**0.083*** **	**0.082*** **	**0.086*** **
	(0.023)	(0.023)	(0.024)
R-squared	0.040	0.052	0.046
R-squared adj.	0.036	0.046	0.041
Observations	3056	3056	2986

Note: Conditional correlations between Formal Involvement and Involvement at Home. * significant at 10%, ** significant at 5%, *** significant at 1%. *Panel B* inverts the order of the correlation in *Panel A*. The index of Parental Involvement at Home includes the frequency of helping the student with homework, having family meals, keeping clear rules, and a regular sleep schedule for the student. The index of Formal Parental Involvement includes whether the respondent is a member of the Parents Committee, the frequency of attending general school meetings, and having placed a suggestion or complaint regarding municipality education services. All regressions include Parent and Student controls. In columns (2) and (3) Municipality dummies are included. In column (3) School controls are included. Parent controls consist of whether the respondent is the student's parent; his age; gender; whether he has a partner; number of dependent children; and whether he has completed primary school. Student controls consist of age, gender and school grade. School controls include the total number of students; total number of teachers; number of classrooms and dummies if the school has at least one bathroom; if it has electricity; and if it has access to water (respectively).

Table A2: Other measures of Parental Involvement

	Test scores (MAT and PT; grades 3, 4 and 5)				
	(1)	(2)	(3)	(4)	(5)
Panel A					
Parent-Teacher Engagement	**0.140***	**0.150***	**0.140***	**0.020**	**-0.094**
	(0.083)	(0.080)	(0.076)	(0.071)	(0.092)
School FE	No	No	No	Yes	No
Class FE	No	No	No	No	Yes
R-squared	0.082	0.113	0.148	0.278	0.510
R-squared adj.	0.079	0.107	0.141	0.244	0.375
Observations	3030	3030	2962	3030	3030
Panel B					
Parent-Community Engagement	**0.168****	**0.176****	**0.128**	**0.138***	**0.195***
	(0.085)	(0.084)	(0.080)	(0.078)	(0.111)
School FE	No	No	No	Yes	No
Class FE	No	No	No	No	Yes
R-squared	0.081	0.111	0.147	0.278	0.510
R-squared adj.	0.077	0.105	0.140	0.244	0.376
Observations	3051	3051	2981	3051	3051

Note: OLS estimates for measures of parental involvement not employed in the main analysis. Robust standard errors clustered at the school-level in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%. *Panel A* reports coefficients for the index of Parent-Techer Engagement (frequency of receiving information on the child's performance; autonomously going to school to talk to the teacher; being invited by the teacher to come to school). *Panel B* reports coefficients for the index of Parent-Community Engagement (frequency of talking to other parents about school; whether the respondent considers that parents in the community understand the benefits of education). All regressions include Parent controls, Student controls, grade and test discipline controls. In columns (2) and (3) Municipality dummies are included. In column (3) School controls are included. Column (4) includes School fixed effects. Column (5) includes Class fixed effects. Parent controls consist of whether the respondent is the student's parent; his age; gender; whether he has a partner; number of dependent children; and whether he has completed primary school. Student controls consist of age and gender. School controls include the total number of students; total number of teachers; number of classrooms and dummies if the school has at least one bathroom; if it has electricity; and if it has access to water (respectively).

Table A3: Second-stage IV estimates (Instrument = Information Treatment in RCT)

	Test scores (MAT and PT; grades 3, 4 and 5)					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Parental Involvement at Home	**0.617**	**0.864**	**0.767**	**0.303**	**0.801**	**0.946**
	(2.102)	(1.816)	(2.287)	(1.803)	(1.575)	(1.960)
Municipality dummies	No	Yes	Yes	No	Yes	Yes
School controls	No	No	Yes	No	No	Yes
First-stage Kleibergen-Paap F-stat	6.419	7.360	3.640	8.415	10.666	6.167
Centered R-squared	0.004	-0.011	-0.012	0.004	-0.016	-0.032
Observations	3056	3056	2915	2880	2880	2744
Panel B						
Parent-Teacher Engagement	**0.832**	**1.441**	**0.938**	**0.481**	**1.230**	**1.044**
	(1.905)	(2.248)	(2.019)	(1.660)	(1.910)	(1.797)
Municipality dummies	No	Yes	Yes	No	Yes	Yes
School controls	No	No	Yes	No	No	Yes
First-stage Kleibergen-Paap F-stat	5.604	4.042	3.957	7.179	5.573	5.701
Centered R-squared	-0.036	-0.130	-0.047	-0.009	-0.091	-0.058
Observations	3030	3030	2891	2857	2857	2723

Note: Second-stage IV estimates. We instrument for parental involvement using exposure to an information campaign employed in the field experiment. Robust standard errors clustered at the school-level in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%. *Panel A* reports coefficients for the index of Parental Involvement at Home (frequency of helping with homework; having family meals; keeping clear rules; keeping a regular sleep schedule for the student). *Panel B* reports coefficients for the index of Parent-Teacher Engagement (frequency of receiving information on the child's performance; autonomously going to school to talk to the teacher; being invited by the teacher to come to school). All regressions include Parent controls, Student controls, grade and test discipline controls. In columns (2), (3), (5), and (6) Municipality dummies are included. In columns (3) and (6) School controls are included. Specifications (1) to (3) employ the same Parent and Student controls as OLS specifications; see notes of *Table 2* for a full listing. Specifications (4) to (6) include additional Parent controls, namely: whether the respondent works in agriculture or fishing; is a housewife; is unemployed; is retired; whether he/she lives in the school neighbourhood; for how long he/she has lived in the current neighbourhood. Specifications (4) to (6) also include additional Student controls, namely: number of siblings in the same school and number of siblings attending other schools.

Table A4: Parental Involvement Indices - Variables Description

Survey Question	*Scale*
Panel A: Principal measures	
Parental Involvement at Home	
In the past two weeks, how many days have you or any adult in the household helped your child with homework?	0 – 14 (days)
In the past two weeks, how many days did all the members of the household sit down and had a meal together?	0 – 14 (days)
How frequently does the following situation occur? "I keep clear rules in my house that my child must obey."	0 (never) – 4 (very frequent)
How frequently does the following situation occur? "I keep a regular wake up and sleep schedule for my child."	0 (never) – 4 (very frequent)
Formal Parental Involvement	
Currently, are you a member of the Parents Committee?	0 (No) – 1 (Yes)
In the past school year, how often did you go to your child's school to attend general school meetings?	0 (never) – 7 (every week)
In the past two years, have you ever placed a criticism, suggestion or complaint related to the educational services of the municipality?	0 (No) – 1 (Yes)
Panel B: Additional measures	
Parent-Teacher Engagement	
In the past school year, how often did the following situation occur? "You received some information about your child's performance at school."	0 (never) – 7 (every week)
In the past school year, how often did the following situation occur? "You were invited for a meeting with your child's teacher."	0 (never) – 7 (every week)
In the past school year, how often did the following situation occur? "You went to school to talk to your child's teacher by your own initiative."	0 (never) – 7 (every week)
Parent-Community Engagement	
How frequently does the following situation occur? "I talk to other parents about subjects related to school or our children."	0 (never) – 4 (very frequent)
Do you agree or disagree with the following statement? "Parents in my community have not yet understood the benefits education brings to the lives of their children."	1 (strongly agree) – 5 (strongly disagree)