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## **Gaps in Cognitive and Socio-Emotional Development between Public and Private School Children in Peru's Urban Areas**

Bárbara Sparrow Alcázar  
and  
Marcela Ponce de León Marquina

2015 No. 70



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

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## About Young Lives

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

## Abstract

This study aims to identify and analyze gaps in cognitive and socio-emotional development between public and private school children in Peru's urban areas. The study uses data from the Young Lives (YL) study and has a mixed methods design. In the quantitative analysis, we apply a Propensity Score Matching (PSM) approach to compare cognitive and socio-emotional outcomes between private and public school children. In the qualitative analysis, we explore if differences in cognitive and socio-emotional development could be reflected in different children's school experiences. Our results indicate that between the seven study cases analysed in Lima there are no evidence that supports these differences attributed to school type. We found that parents perceived private education as better than public education because of a general belief that private education is better no matter what. Among the most important reasons given by parents for believing in the superiority of private education are the quality of teachers and the possibility that parents can demand for better services because they are paying for it.

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## 1. Introduction

In the last years, as in many other developing countries, access to both primary and secondary education in Peru has increased significantly. According to the National Household Survey (ENAHU, 2012), the percentage of the population from 6 and 11 years old enrolled in primary education and from 12 to 16 years old in secondary education is 97.4% and 91.6%, respectively. Nevertheless, the quality of the Peruvian educational system cannot be measured exclusively in terms of the access to education, but also in the learning achieved by their students (Leon and Cueto, 2013).

In this regard, several studies conducted in our country have focused their analysis on the factors associated to cognitive measures such as academic achievement, finding that students from higher socioeconomic status who live in urban areas, attend private schools, have more educated parents and whose mother tongue is Spanish are those who obtain the best educational outcomes in both Reading Comprehension and Mathematics (MINEDU, 1998; UMC, 2004; UMC, 2006, UMC, 2013). When referring to the type of school management, these studies found that although students in private schools have better academic achievement than those from public schools, the quality of private education is heterogeneous and student's educational outcomes are more associated to socioeconomic status (Cuenca, 2013).

Other studies have examined the relationship between learning opportunities and student's academic achievement in Reading Comprehension and Mathematics. Among their main results, they found that what happens in the classroom is far from what should happen according to the pedagogical proposal (Cueto et al, 2003; Cueto et al, 2004; Cueto et al, 2006).

Although all these studies discuss educational quality, they have not focused exclusively on the differences between public and private school education and also haven't pay attention to the importance of non cognitive measures such as socio-emotional development on children learning and success in school. It is worth mentioning that the child development is a multidimensional process that includes a psychomotor, cognitive and socio-emotional dimension. All these dimensions are interrelated and should be approached in an integrated manner, being the child development an integral process (Myers, 1993). In this regard, a child's social-emotional development is as important as their cognitive development, especially because provides them with a sense of who they are in the world, how they learn, and helps them establish bonds and relationships with others.

Taking all these into account, in the present study we identify and analyze gaps in cognitive and socio-emotional development between private and public school children in urban areas. For the purposes of this study, we consider that children attend a private schools if they attend a school that is under private management.<sup>1</sup> To achieve these purposes, we use both quantitative and qualitative data for Peru from the Young Lives study. Through a quantitative analysis, we look into the existence of gaps in cognitive

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1. Fe y Alegría schools are schools under private management that operate with public funds. Around 4 percent of the children in the urban sample attend this type of schools.

and socio-emotional development between public and private school children by trying to isolate the effects of school type over cognitive and socio-emotional variables. We also discuss whether these gaps vary when socioeconomic level is taken into account. Later, using the qualitative data available, we explore if these differences could be reflected in different children's school experiences.

The main research questions of this study will be: i) is there a gap in cognitive and socio-emotional development between public and private school children?; ii) are these gaps the same when socioeconomic status is taken into account?; iii) how children experience schooling in different educational contexts?, and iv) what can the children experiences tell us about what is behind the existence of these gaps?

This report is organized in six sections, including this introduction. In the second section, an international and national literature review is presented. The third section presents a theoretical framework on educational effectiveness. The fourth section describes the data and provides information about the analysis methodology. The fifth section presents the main quantitative and qualitative findings. Finally, in the last section, some conclusions and recommendations of public policy are provided in the light of the results obtained.

## 2. Literature Review

The literature both at international and national level regarding the cognitive and socio—emotional gaps between students from public and private schools is not abundant. Most of the studies conducted at both levels have focused on aspects related to student’s cognitive skills acquisition such as their academic achievement or opportunities to learn. In Peru, the Quality Measurement Unit (UMC) of the Ministry of Education (MINEDU) has been evaluating educational quality of schools in terms of the learning achieved in Math and Reading Comprehension achieved by second and fourth grade of primary education students. According to the UMC (2013), while private school students have obtained better results than public schools students, they still have not been able to achieve the expected levels. This situation is also reflected in international evaluations conducted by the Latin American Laboratory for Assessment of the Quality of Education (LLECE) and The Organization for Economic Co-operation and Development (OECD). The first of these evaluations assessed the academic achievement in Mathematics, Reading Comprehension and Natural Sciences of Latin American students in the third and sixth grade of primary education. The second of these evaluations assessed the academic performance of fifteen years old students in the same areas.

According to the Third Regional Comparative Education Study, conducted by the LLECE, the learning levels of Peruvian students have improved significantly in comparison to the previous evaluation. Peru is the country that has made most progress in Mathematics on third and sixth grade, Natural Sciences in sixth grade, and Reading Comprehension in third and sixth grade (UNESCO, 2013). However, we have still not reached satisfactory learning levels in all our students. Furthermore, the last results of The Programme for International Student Assessment (OECD, 2012) show that there is still a gap in academic achievement between students from rural and urban areas, in favour of the latter.

However, it should be noted that these studies tried to explain which factors are associated with students’ academic performance, not emphasizing the school type of management. In this regard, in the context of our country, there exists few studies that analyse the differences in students’ academic achievement from public and private schools. Valdivia (2003), using data from the national evaluation of 2001, evaluate the Peruvian private education effectiveness and found a positive effect in Math and Reading Comprehension achievement from students in fourth grade of primary education. More recently, Cuenca (2013) also explored the differences between students from both public and private education in Lima, finding that students in private schools obtain better results compared to their peers in public schools.

Moreover, several studies in Peru have tried to explain the students’ academic achievement taking into account what happens in the classroom through the analysis of their learning opportunities. Cueto et al. (2003) found that, in a sample of sixth grade primary education students from public schools in Lima, subjects taught in classes are not related to the curriculum coverage (according to the National Curriculum) and teachers feedback in notebooks and workbooks are very limited. Likewise, Cueto et al. (2004) found that the number and the cognitive demand of exercises solved by students at third and fourth grade of primary education in Lima and Ayacucho significantly explained their Mathematics scores. Cueto et al. (2006), using the same sample of the previous

study, also examined the students opportunities to learn in Reading Comprehension and its relationship with their socioeconomic status. They conclude that most of the solved exercises during classes are not related with the existing curriculum structure and belong to the lowest levels of cognitive demand (memorization and mechanical work).

More recently, Cueto et al. (2014), using the longitudinal data from the school survey of YL, explores the relationship between socio-economic status measured at the age of one, opportunities to learn and achievement in Mathematics ten years later. Their results showed a strongly association of number of exercises attempted by students in fourth grade with achievement in Mathematics and also that socio-economic status at the age of one was significantly related with variable and with achievement by the students were 10 years.

Likewise, there also exists studies that have analysed the factors associated to cognitive development in Peru. Some of them have even used the same data base used in this paper (YL survey). Lopez Boo (2004) examined the relationship between socioeconomic status and early childhood cognitive skills (receptive language ability) among children aged 55 to 102 months in Ethiopia, India, Peru and Vietnam, finding that although differences in cognitive skills by SES are present in all countries, they arise more starkly in our country. Arteaga and Glewwe (2014) take into account children linguistic background and measured the effects of parental education, family factors, child health and geographic location on the achievement gap between indigenous and non-indigenous children in Peru and found that household and child characteristics are associated to the achievement gap, mainly caused by parental education, children's nutritional status and number of years they attend school.

As it can be seen, there is an important gap in the literature because most of the studies conducted on this issue have focused their analysis on the factors associated to cognitive measures such as Mathematics or Reading Comprehension, not taking into account the importance of socio-emotional development as an indispensable dimension of students learning.

Nevertheless, there are some studies that analyze the relationships between school related variables and socio-emotional development and also the effects of socio-emotional factors on student's achievement. Murillo and Hernandez (2011), for example, in the context of developed and Iberoamerican countries, conducted a study in order to estimate the magnitude of school and classroom effects for different socio-emotional measures (self-concept, classroom behaviour, social interaction and satisfaction with school) in primary education as well as the consistency between them. Regarding the main findings, the authors suggested that the school plays a very limited role in student's socio-emotional development possibly because it is unknown how teachers could contribute to the development of self-concept, for example.

In the Peruvian context, Cueto, Ramirez and Leon (2003) analyzed the effects of school related variables on both cognitive (Mathematics and Reading Comprehension) and socio-emotional (self-concept) measures as well as in dropout and repetition rates. Among the main results, they found that there are schools that have a high, low and mixed performance over these results.

More recently, Outes, Sánchez and Molina (2010), using data from the YL survey, tried to understand the role played by psychosocial competencies (perceptions of respect) in the formation of cognitive skills during the transition from mid to late childhood, suggesting that children who perceive themselves as poorly respected at 8 years old are likely to accumulate fewer cognitive skills by the age of 12 than their well-respected counterparts. Finally, Dercon and Sánchez (2011) tested the role of nutrition in shaping non-cognitive skills (self-esteem, self-efficacy and educational aspirations) during early childhood and found evidence of a robust and positive correlation between height for age measured during mid-childhood and non-cognitive skills during the last stage of childhood.

On the other hand, there are also studies that have focused their analysis exclusively in non-cognitive measures such as socio-emotional intelligence. For example, Matalinares et al. (2005) conducted a study in order to establish if there exist or not a relationship between socio-emotional intelligence and self-concept of students in fifth grade of secondary education from public schools in Lima, finding a positive association between both variables. Sotil et al. (2008), also examined the effects of a program that tried to developed socio-emotional intelligence in students of sixth grade of primary education from both public and private schools. Between the main results, the authors found that the program increased student's socio-emotional intelligence in the experimental group.

As has been previously noted, there is a gap on educational research because most of the studies have focused their analysis on the factors associated to cognitive measures such as Mathematics or Reading Comprehension, disregarding not only the importance of non cognitive measures such as socio-emotional development on children learning and success in school but also not considering exclusively the effect of school type management. Taking this into account, we hope that our study contributes to fill these gaps as well as to motivate further studies in these areas.

### 3. Theoretical Framework

The present study situates itself within the field of educational effectiveness research (EER), which arises in response to some US studies that found that students background and socioeconomic status were more important in determining educational outcomes, pointing out also that schools had little effects on students achievement (Cueto, Ramírez and León, 2013).

School effectiveness refers to the quality and equity of education and aims to know what makes a school effective, seeking to understand the school characteristics that could explain the differences between student's educational outcomes (Murillo, 2003). In this sense, school effectiveness seeks to identify the factors influencing the better results gained by students from certain schools, in comparison to their peers with similar characteristics.

An effective school, therefore, can be understood as *“one that gets a full development of each and every one of his students, greater than what would be expected given their previous academic performance and the social, economic and cultural situation of families”* (Murillo, 2005). It is worth noting that research on educational effectiveness has allowed perceive schools as opportunities to transform society, reducing social inequalities and leveling the field for students coming from more disadvantage socioeconomic backgrounds because they are more easily alterable and may be subject to public policy.

Given the above, by choosing this framework we want to give special attention to the effects of attending a particular school (public or private) on children's cognitive and socio-emotional development in order to understand what would be making a difference in their educational outcomes.

## 4. Data and Methods

### 4.1 Data

This study uses a mixed methods design. We use both quantitative and qualitative data in order to analyze gaps in cognitive and socio-emotional development between public and private school children in Peru.

The quantitative data come from the longitudinal Young Lives (YL) Peru survey. This survey includes information on two cohorts of children (born in 1994/1995 and 2000/2001) through various stages of their lives. For this study, we focus on the younger cohort and follow their development across three survey waves.

The YL Peru survey sample comes from 20 selected sites across the country. The sites were selected with a pro-poor bias, ensuring that randomly selected clusters excluded districts located in the top five per cent of the poverty map developed in 2000 by the National Fund for Development and Social Compensation (FONCODES) (Escobal and Flores, 2008). Within each site, a hundred households were randomly selected, considering the fact that selected households had to have children of the appropriate age (6 to 18 months in 2002). At the same time, 1,000 older children (aged 7 to 8 years) were also randomly selected in the same sites.<sup>2</sup>

The YL data base is particularly useful as it allows us to compare cognitive and socio—emotional indicators controlling for variables from different stages in the child’s development. Using these data allows us to make the matching process much more exact, which helps us to better identify the effects of school type over selected outcome variables. As Table 1 shows, the YL data base includes information for 1,911 students in private (18.37%) and public (81.63%) schools across the country in the year 2009 (Round 3). We restrict the analysis to the urban areas as the sample of children attending privately managed schools in rural areas is small (only 10 observations) and may bias the estimations.<sup>3</sup> Thus, in the quantitative section, we work with data from 1,369 students in urban areas that attend privately managed schools (24.91%) and publicly managed schools (75.09%).

2. Some attrition is expected in any longitudinal study. The YL data had an attrition rate of 2.8% across the whole sample between Rounds 1 and 3. This is low in both absolute terms and in relative terms (when compared with attrition rates for other longitudinal studies in developing countries). Attrition between Round 1 and Round 2 has been assessed for attrition bias. Analysis shows that attrition between Round 1 and Round 2 was an overwhelmingly random phenomenon. For further on this topic, see: <http://www.younglives.org.uk/files/methods-guide/methods-guide-cohort-maintenance>.

3. According to the Ministry of Education (2009 data), less than 2 percent of the children enrolled in a private school were from rural areas.

**Table 1**—Number of students in the YL data base, by type of school

		Public School	Private School	Total
Rural	N	532	10	542
	%	98.15	1.85	100
Urban	N	1,028	341	1,369
	%	75.09	24.91	100
Total	N	1,560	351	1,911
	%	81.63	18.37	100

Source: Young Lives third round data.

The qualitative data used focuses on the younger cohort of the YL, belonging to the third round of data collection took place in 2011. As most private schools in the sample are in Lima—all in urban areas—we analyzed only the schooling experiences of the 7 children that are part of the qualitative sub-component of YL. Five of these children are from public schools and the remaining two are from private schools. Also, three of them are in fourth grade of primary education and the other ones in fifth grade.

## 4.2 Methodology

As it was mentioned above, this study uses both quantitative and qualitative methods. The main advantage of this approach is that it allows researchers to have a better understanding of the problem analyzed (Creswell, 2009). The qualitative analysis complements the quantitative findings, looking into what is behind the identified effects. For the quantitative analysis, we use *Propensity Score Matching* (PSM). This is a method that constructs comparable groups accounting for covariates, so that the difference can be attributed to treatment (Rosenbaum and Rubin, 1983). In the analysis, we use the dummy variable that indicates if the child is in a private school (1 if the child attends a privately managed school in 2009, 0 if the child attends publicly managed school in 2009) as the treatment variable.<sup>4</sup> We only consider children that have maintained school type through their whole school experience. We chose to analyze the effect of private schools as a “treatment” variable as we are interested in observing whether attending a private school provides an additional advantage to public school education between comparable children. The PSM approach allows us to compare cognitive and social-emotional development between both groups.

The matching process takes into account household variables in the third round as well as variables from previous rounds. The use of relevant data from different stages in the child’s development makes the matching process far more exact, allowing us to isolate the effects of school type on selected outcome variables. To measure cognitive development we will use the Peabody Picture Vocabulary Test (PPVT) and a mathematics

4. As not all the matching methods used in the analysis follow one-to-one methodologies, the selection of the treatment variable may lead to different results. To look into this possibility, we also made the analysis using attendance to a publicly managed school as the treatment variable. Results differ slightly in magnitude though not in significance when using “attendance to a publicly managed school” as the treatment variable.

achievement test. To measure socio-emotional results use a self-efficacy index, a pride index and a variable that measures respect.

The variables included in the matching process are variables that predict treatment (attending a private school) as well as cognitive and socio-emotional outcomes. The Young Lives data base is particularly useful for this purpose as it has information from previous rounds which allows us to compare children that have similar nutritional backgrounds (Round 1, anthropometric information), similar achievement levels before school enrolment (Round 2, PPVT), parents with similar academic expectations for their children (Round 2, expectation data), parents with similar background (Round 3, mother tongue/ educational level), among other variables.<sup>5</sup> Once the score is estimated, the matching process is done using both nearest neighbour matching and kernel matching. Matched treatment and control group children are compared to find the differences in cognitive and socio-emotional variables.

For the qualitative analysis, we use the information carried out on the individual interviews with caregivers/mothers for both public and private school children in Lima. The qualitative sub-component of YL supposes case studies that describe the schooling experience of the children in the sample. Specifically, we pay special attention to the following themes: i) reasons for sending the child to a public or private school; ii) perceptions of the caregiver about the school; iii) caregivers involvement and participation in the school; iv) child's peer relationships; and finally, v) perceptions about the teacher and the relationship with the child.

### ***Selected variables for measuring type of school effect over cognitive and socio—emotional variables***

We use two variables to measure cognitive development and three variables to measure socio-emotional development among public and private school children. To measure the child's cognitive development, we use the Peabody Picture Vocabulary Test (PPVT) score and the score of a mathematics achievement test. To measure socio-emotional development, we use a self-efficacy index, a pride index and a variable that measures respect.

The PPVT is a test of receptive vocabulary.<sup>6</sup> Through the test, children are asked to select from four pictures which represent better a word presented to them orally by an examiner. The test is untimed and is administered individually. The PPVT is used as several studies have found a positive strong correlation among the score and some commonly used intelligence measures (Cueto and León, 2012).

The mathematics achievement test aims to measure basic quantitative and number notions. The test includes two sections. The first section includes nine items on counting, knowledge of numbers, number discrimination, and basic operations. Questions were

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5. As it can be observed, we are not considering school related variables in the matching process. By focusing on the children's characteristics we intend to analyze if, on average, all of the factors that come with being in a private school (better or worse infrastructure, better or worse teachers, among others) have an effect over a child's cognitive and socio-emotional development. We also do not control for the fact that some children may not be able to attend private schools because of supply restrictions. We believe that this is not important as children that would attend private schools if one was available but do not attend one are even more similar to children that actually attend private schools (and thus act as a better control group).

6. The YL survey administered the PPVT-R (125 items) adapted for Latin America.

administered by an examiner with the help of cards (there is no interference from poor reading skills). A second section includes twenty items using numbers for addition, subtraction, multiplication and division. Children took the test at their own pace, but the test was discontinued after eight minutes.

For the socio-emotional outcome variables we constructed indicators that intend to approximate a set of children’s competences in non-cognitive dimensions. The YL questionnaire includes a set of items that aim to measure children’s traits and competences related to self-esteem, self-efficacy and perception of respect from others. We used the available data to construct indicators for these three groups of competences (see Box 1). All three dimensions have been found to correlate well with future social and economic opportunities (Dercon and Sanchez, 2011).

**Box 1—Socio-emotional indicators and questions used\***

Self-efficacy index	If I try hard, I can improve my situation in life.
	Other people in my family make all the decisions about how I spend my time [recoded to positive].
	I have no choice about the work I do—I must do this sort of work [recoded to positive].
	I like to make plans for my future studies and work.
	If I study hard at school, I will be rewarded by a better job in the future.
Pride and self-esteem index	I am proud of my shoes or of having shoes.
	I am proud of my clothes.
	I am never embarrassed because I do not have the right books, pencils or other equipment.
	I am proud that I have the correct uniform.
	I am proud of the work I have to do.
Respect	Answer to the question: Do you think people in this area treat you well or badly? (1= Yes, 0=No)

Note: \* Indexes were constructed using factorial analysis (PCF).

The concept of self-efficacy is related to a person’s sense of master over his or her own life. In turn, self-esteem is related to a person’s evaluation of their own worth. To approximate both of these concepts, we estimate indicators based in respondents’ agreement or disagreement to the statements presented in the box above. The degree of agreement is measured in a 1 to 5 scale. The indicators were constructed using Principal Components Factorial Analysis.

The statements used in the construction of these indexes are drawn from the educational psychology literature. Both indexes are based on existing scales adapted to children and used by other authors that have worked with the YL survey.<sup>7</sup> The self-efficacy index is

7. The indexes are based on the same variables considered by Dercon and Singh (2011). Dercon and Krishnan (2011) discuss the validity of these indicators.

built on the concept of locus of control following Rotter (1966) and Bandura (1993). The self-esteem index is based on Rosenberg self-esteem scale (Rosenberg, 1965).

The respect variable—which intends to measure the child’s perception of respect from others—is based on the child’s response to the question: Do you think people in this area treats you well or badly? This response is interpreted in the study by Outes, Sanchez and Molina (2010) as an assessment of the child’s sense of inclusion and respect in their local community. They found evidence that this measurement is correlated with measurements of self-esteem and perception of psychosocial status in Peru.

### ***Selected variables for the matching process***

For the matching process we selected variables that predict treatment (attending a private school) as well as cognitive and socio-emotional outcomes. The Young Lives data base is particularly useful as it has information from different stages in the child’s development, which allows us to compare children with similar backgrounds and characteristics. The main goal of this process is to be able to distinguish between the effects of attending a private or public school from the fact that—on average—the children that attend private schools have characteristics that may positively achieve their cognitive and socio-emotional development.

To estimate the propensity score, we take into account a set of children’s, parents’ and households’ characteristics. Investigations have found that variables such as socioeconomic status and maternal education level are significant predictors of the child’s performance on standardized measures and overall intellectual functioning (Restrepo et al., 2006). Taking this into account, we include variables such as the wealth index (in 2009), if the caregiver’s mother’s language was Spanish and if the mother has more than primary education (in 2002).

Variables related to the children’s cognitive development before and out of school are also included in the analysis. We consider if the child attended preschool, the academic expectations of the mother for the child (in 2006), the child’s PPVT score before attending school and the language in which the test was taken. We also consider if the child was stunted, which has been found to have a positive and significant return on cognitive development (Outes-Leon et al., 2010). We also consider variables related to socio-emotional outcomes: if the child’s mother asked for help on an issue related to violence (in 2009) and the child’s mother socio-emotional index (in 2006).

The child’s birth order, the household size (in 2009), the child’s sex, the mother’s age when the child was born (in 2002), and if the caregiver had a partner when the child was born (in 2002) are also variables included in the estimation of the propensity score.

## 5. Results

### 5.1 Quantitative Analysis: Procedures and Results

In order to analyze the differences between public and private school children, we begin by looking at the main characteristics within each group. The average age in both groups is 8 years old in 2009. In both groups, half the children are male. Mothers are, on average, about 27 years old when the child is born and about 87% of the caregivers have partners during the first survey round.

Some of the major differences between groups are related to socioeconomic status (the wealth index is clearly higher in families of children in private school). For example, 24% of children that attend public schools are stunted in 2002 (height for age below  $-2$  SD of WHO standards) while only 10% of children in private schools present the same condition. Also, mothers of children in private schools have on average a higher education level than mothers of children in private schools.

It can also be observed that a higher percentage of private school children attended preschool than public school children (94% vs. 82%). 51% of private school children that attended preschool went to a private preschool while 81% of public school children that attended preschool went to a public preschool. Most private school children live in the coastal region.

**Table 2**—*Descriptive statistics (selected variables), by school type*

Variables		Private School	Public School
Sex child (male)	mean	50%	51%
	sd	0.50	0.50
Age child (months) in 2009	mean	94.72	95.01
	sd	3.58	3.61
Birth order	mean	1.75	2.34
	sd	1.13	1.59
Mother has more than primary education in 2002	mean	82%	57%
	sd	0.39	0.49
Age mother in 2002	mean	26.89	26.55
	sd	6.15	6.50
Caregiver has a partner in 2002	mean	87%	87%
	sd	0.34	0.33
Caregiver's mother's language is Spanish	mean	88%	79%
	sd	0.32	0.41
Stunted in 2002	mean	10%	24%
	sd	0.302	0.428
Child attended preschool in 2006	mean	94%	82%
	sd	0.25	0.38

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Variables		Private School	Public School
Child attended private preschool in 2006	mean	51%	6%
	sd	0.50	0.24
Child attended public preschool in 2006	mean	43%	81%
	sd	0.50	0.39
Child attended PRONOEI preschool in 2006	mean	5%	11%
	sd	0.21	0.31
PPVT score in 2006	mean	45.48	30.90
	sd	14.30	16.41
Household size in 2009	mean	5.02	5.22
	sd	1.86	1.79
Wealth index in 2009	mean	0.75	0.59
	sd	0.11	0.17
Child lives in the coast in 2009	mean	69%	44%
	sd	0.46	0.50
Child lives in the highlands in 2009	mean	28%	39%
	sd	0.45	0.49
Child lives in the jungle in 2009	mean	3%	17%
	sd	0.17	0.38

Source: Young Lives first, second and third round data.

As it was previously explained, the matching process allows us to isolate the effects of attending a private or public school over cognitive and socio-emotional outcomes from the effects of the other existing differences among both groups. If we do not control for these variables, we could made the mistake of attributing the effects of, for example, having a better socioeconomic condition to the fact that the child was in a private school (given that having a better socioeconomic condition is associated to the probability of being in a private school).

For the matching process, we have considered variables that may have an effect over the probability of being assigned to treatment (attending a private school) as well as variables that may have an effect over cognitive and socio-emotional outcomes. The variables used for matching students are the following:<sup>8</sup> if the child attended preschool, child's birth order, child's sex, if the child's mother asked for help on an issue related to violence (in 2009), child's PPVT score (in 2006), the language in which the child took the PPVT, if the child's growth was stunted, the mother's socio-emotional index (in 2006), the academic expectations of the mother for the child (in 2006), the mother's age (in

8. The "violence" variable was constructed from the survey question (to caregiver): Ever needed help with child abuse or family violence. The mother's socio-emotional index was constructed considering the following items: (i) If I try hard, I can improve my situation in life, (ii) I have no choice about which school to send my child to, (iii) If my child gets sick, I can do little to help him/her get better, (iv) I can do little to help my child get better in school no matter how hard I try, (v) Other people in my street look down on me and my family. The academic expectations variable was constructed following Dercon and Singh (2011). It comes from the question (to caregiver): Ideally what level of education would you like [NAME] to complete? It is coded as "years of education" (University=15). Finally, the wealth index is a variable that is already constructed in the data base.

2002), if the caregiver had a partner (in 2002), the caregiver’s mother’s language, if the mother has more than primary education (in 2002), household size (in 2009), household wealth index (in 2009), and if the child lives in the coast (in 2009). It should be noted that all variables measured in 2002 correspond to a stage of the child’s development that is very near to the child’s birth while all variables measured in 2006 are from the time before the child got into school. The matching results are presented in Appendix 1. Tables 3 through 7 show the differences in the selected outcome variables before and after the matching process. Tables 3 and 4 present differences in cognitive development variables. As it is shown, the PPVT score and the score of the mathematics achievement test are higher for private school children than for public school children even after the matching process. Tables 5, 6 and 7 present the results for socio-emotional variables. As it can be observed, the differences in socio-emotional indicators are only significant before matching.

The difference in the PPVT score between private and public school children before matching is more than 10 points (0.7 times the PPVT score’s SD). After matching, the difference remains statistically significant, though it is much smaller (2.8 points, 0.2 times the SD). The same is observed when looking at the difference between private and public school children in the mathematics achievement test. The score of children from private schools is, on average, 3.6 points higher than for public school children (0.7 times the standard deviation). The difference after matching is of 1.8 points (0.35 times the SD).

**Table 3—Differences in PPVT score by type of propensity score matching<sup>1</sup>**

PPVT score	Private	Public	Difference	Confidence Interval (95%)	
				Inferior	Superior
Score without matching (n=1,238)	72.47	61.94	10.53***	—	—
Score with nearest neighbour (n=1,121)	72.36	69.51	2.84**	0.95	4.74
Score with normal kernel matching (n=1,123)	72.40	69.52	2.88**	1.07	4.69

Notes: 1: Nearest neighbour and kernel matching were estimated without replacement. Confidence intervals were estimated using bootstrapping with 500 repetitions.

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

**Table 4—Differences in Mathematics Achievement Test score by type of propensity score matching<sup>1</sup>**

PPVT math score	Private	Public	Difference	Confidence Interval (95%)	
				Inferior	Superior
Score without matching (n=1,262)	18.52	14.90	3.61***	—	—
Score with nearest neighbour (n=1,143)	18.42	16.67	1.75***	0.97	2.53
Score with normal kernel matching (n=1,145)	18.43	16.62	1.82***	1.06	2.57

Notes: 1: Nearest neighbour and kernel matching were estimated without replacement. Confidence intervals were estimated using bootstrapping with 500 repetitions.

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

The differences in the self-efficacy index, the pride index and the respect variable are significant before matching. In the three cases, the index is higher for private school children than for public school children (.22, .31 and .10 times the standard deviation). As it was mentioned, in the case of these three variables, the differences are not statistically significant after the matching process. These differences are also considerably smaller.

**Table 5—Differences in Self-efficacy index by type of propensity score matching<sup>1</sup>**

Self efficacy index	Private	Public	Difference	Confidence Interval (95%)	
				Inferior	Superior
Score without matching (n=1,278)	0.27	0.05	0.22***	—	—
Score with nearest neighbour (n=1,158)	0.25	0.16	0.09	-0.08	0.26
Score with normal kernel matching (n=1,160)	0.25	0.16	0.08	-0.09	0.26

Notes: 1: Nearest neighbour and kernel matching were estimated without replacement. Confidence intervals were estimated using bootstrapping with 500 repetitions.

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

**Table 6—Differences in Pride index by type of propensity score matching<sup>1</sup>**

Pride index	Private	Public	Difference	Confidence Interval (95%)	
				Inferior	Superior
Score without matching (n=858)	0.41	0.13	0.28***	—	—
Score with nearest neighbour (n=801)	0.39	0.36	0.03	-0.16	0.22
Score with normal kernel matching (n=802)	0.39	0.36	0.03	-0.15	0.21

Notes: 1: Nearest neighbour and kernel matching were estimated without replacement. Confidence intervals were estimated using bootstrapping with 500 repetitions.

\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

**Table 7—Differences in Respect variable by type of propensity score matching<sup>1</sup>**

Respect	Private	Public	Difference	Confidence Interval (95%)	
				Inferior	Superior
Score without matching (n=1286)	0.97	0.95	0.021***	—	—
Score with nearest neighbour (n=1165)	0.97	0.95	0.01	-0.02	0.05
Score with normal kernel matching (n=1167)	0.97	0.95	0.01	-0.02	0.05

Notes: 1: Nearest neighbour and kernel matching were estimated without replacement. Confidence intervals were estimated using bootstrapping with 500 repetitions.

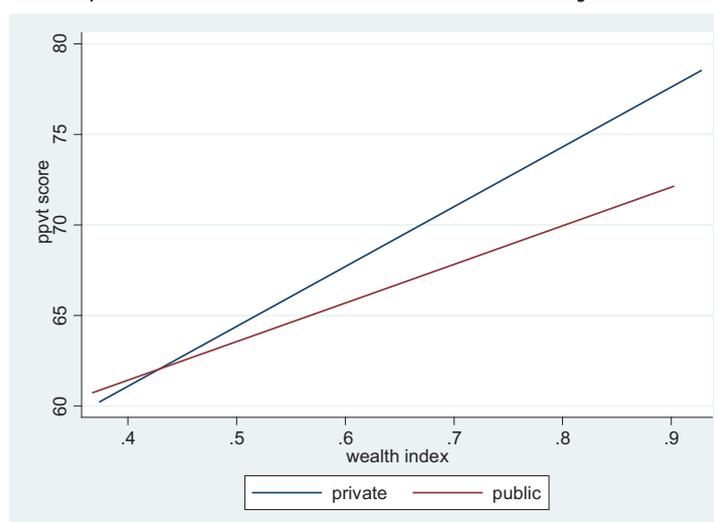
\* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

After this analysis, we can conclude that school type has a significant effect over cognitive indicators. We now analyze how these differences vary across socioeconomic level. The following figures show the relationship between the cognitive indicators analyzed and the wealth index for comparable (matched) children. As it is shown, the differences in the PPVT score among private and public school children becomes larger with the child's socioeconomic level. In the case of the math score, the gap remains constant across socioeconomic levels (it even seems to decrease). These relationships suggest that school type has a more homogenous effect over mathematical achievement across socioeconomic levels than over vocabulary indicators.

The reasons behind these differences could be many. As Cueto et al. (2004) have discussed, there is a direct effect of the number and cognitive demand of the mathematical exercises done by children in school over mathematics test scores. This suggests that cognitive results in mathematics are mostly caused by school work. Cueto et al. (2013) also find that there is a considerable difference on the number and quality of exercises done by children in schools with a higher socioeconomic level—which, in their sample, consisted mostly of private school children—than by children with a lower socio-economic level—mostly public school children.<sup>9</sup> The fact that school work has a direct effect on mathematics test scores could explain how being in a private school could have a direct and constant impact over outcomes in mathematics indicators.

The effects of school type over vocabulary indicators do seem to change with socio-economic level. It would appear that in order to have a significant effect over PPVT scores it is required that the school's education has a higher quality (given that school's quality is associated with socioeconomic level). It could thus be hypothesized that the impact over vocabulary outcomes require that the school has further involvement in the child's development than in the case of mathematical outcomes. A more comprehensive approach may be needed.

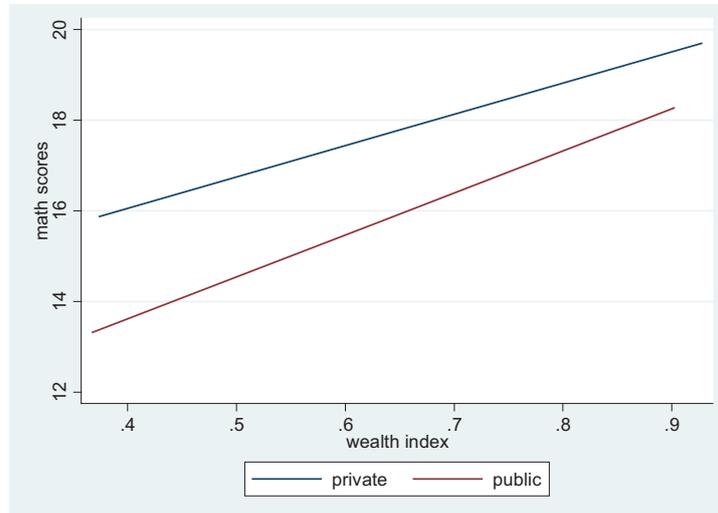
**Figure 1**—Relationship between PPVT scores and wealth index after matching



Source: Young Lives third round data. Restricted to matched sample.

9. In the study, it is stated that a higher socioeconomic level is associated with a higher number of mathematical exercises in both private and public schools. Although the differences between both groups are present across socioeconomic levels, the gap seems to decline slightly in families with a higher socioeconomic level (it should be consider that the YL sample is pro-poor), which may suggest that differences in variables such as “number of mathematical exercises” declines between public and private schools with higher socioeconomic level.

**Figure 2**—Relationship between Math achievement test scores and wealth index after matching



Source: Young Lives third round data. Restricted to matched sample.

## 5.2 Qualitative Analysis: Schooling Experiences Between Children in Private and Public Schools

As has been pointed out before in a previous section, using the YL qualitative data, we explore the differences between cognitive and socio-emotional development between private and public school children could be reflected in their school experiences from the perspective of the caregiver/mother. Specifically, we pay special attention to the following themes: i) reasons for sending the child to a public or private school; ii) perceptions of the caregiver about the school; iii) caregivers involvement and participation in the school; iv) child’s peer relationships; and finally, v) perceptions about the teacher and the relationship with the child. Bellow, we describe exclusively the children’s schooling experiences in the sample.

### Ricardo

When the third round of the YL qualitative sub—component took place, Ricardo was 9 years old and was in fourth grade of primary education in a public school. Her mother describes him as an obedient child and highlighted that he usually helps her with the household chores (for example: sweep the floor and wash the dishes), even when she didn’t ask him for help. Nevertheless, his most important responsibility it’s to study, doing well at school and do his homework. Regarding this issue, the mother said:

*“He likes to help me. I’m going to sweep, I could help you or what can I do? Peel potatoes? he said. But I say to him that he is very small, you could cut yourself. I help you mom, he said, to wash the dishes. He always help me, he is very obedient (...). His responsibility is to do his homework, wash his hands and eat” (Caregiver, public school).*

Ricardo it’s a good student. In her mother words “*he is doing well at school because he brings me twenties (of grades)*” and when he has to do his homework, he always received

help from his father. However, unlike the last year, he doesn't like to go to the school because his current teacher doesn't treat well children and yell them. When asked about the relationship between her son and the teacher, she responded:

*"Yes, he didn't want to go (to the school). I don't like the teacher, he said. I don't like the teacher because she yells at me. She looks angry and it seems like she is going to hit me. She looks at me with eyes of tiger, he said"*

—Caregiver, public school

Another important topic explored was how well her child gets along with their peers. In this regard, the mother mentioned that Ricardo has good relationships with their school peers and didn't have problems adapting to the school. Regarding what he have learned at school, his mother pointed out exclusively indicators of cognitive development associated with Math skills and Reading Comprehension and also when asked about what else she would like that her son have learned, she highlighted a little more of Reading Comprehension.

It should also be noted that for Ricardo's mom, meetings with parents at school are very important because it allows them to know about the academic performance of their children and how they are behaving at school. However, she describes Ricardo's teacher as "antisocial" and highlighted that in the last three months, the school have not scheduled a parents meeting. About this, the mother said:

*"We have to come to inquire about our children, about how they are doing at school. We have to be communicated. And the teacher said: "No, I don't like to be friend with any parent." "I'm not going to talk about my life with anyone." We don't want to know about her life, we wanted to know how our children are doing at school, how they behave, how they are in their studies."*

—Caregiver, public school

### **Karla**

Karla is 10 years old and is in fifth grade in a public school. Her grandmother described her as a peaceful and quiet girl but also as someone who grumbles a lot, attributing it to her mother absence because she doesn't live with her. In this regard, Karla's grandmother emphasizes that "the separation of her parents affected her a lot." Therefore, she tried to support her in everything she needs. Regarding her main responsibilities within the home, the grandmother mentioned that she usually helps her with the housework; however, her main responsibilities are doing her homework and study.

Likewise, the grandmother noted that Karla studies in a public school mainly because it's the closest school to their home and it's where her older sister also studied. Like the previous case study described, Karla is a good student and is doing very well at school because she gets good grades. When asked the grandmother how Karla was doing at primary education she indicated that:

*"I think she is doing well at school because of her grades. She would obtain lower grades if she doesn't study, no?"*

—Caregiver, public school

Karla's grandmother also emphasized that they are constantly awaiting of her performance at school and when she needs help in her homework or doesn't understand something

related to her courses at school, usually gets support of her father or older sister. It is also important to note that when asked about what else she would like that Karla learn at school, besides Math and Reading Comprehension, the grandmother pointed out that she would like that the school raises their teaching standards for both courses as happens in private schools. In this sense, private education is perceived as better than public education. About this issue, the grandmother said:

*“At school they should teach them more Math and Reading, a bit more advanced as in private school because here is not the same”*

—Caregiver, public school

### **Andrea**

Andrea is 9 years old and is in fourth grade. As in the study cases described above, she also attends to a public school. Her mother describes her as a mature but disobedient child who usually helps her with the household tasks when she threatens to physically punish her.

*“When I’m with the belt in my hand and I yelled at her she listen to me. When I talk to her nicely, she says “I am going to do it right now” and the next day arises and she hasn’t done already”*

—Caregiver, public school

Andrea still attending the same school as in previous years because it is the nearest to their home and it’s the same school where her mother and brothers have studied. When asked about the reasons to enroll her child in a public school, the mother mentioned that:

*“First of all because it is near to our home. I studied there. It is close to the house ... especially to my mother’s house. I find this school more confident. All my children have studied in that school.”*

—Caregiver, public school

Regarding the mother perceptions of the school, she emphasizes that education provided is not good mainly because teachers frequently are absent and don’t attend classes. Nevertheless, she believes that her daughter is doing well at school because she doesn’t need help in doing her homework. About this, Andrea’s mother pointed out:

*“She is doing well because I see that she makes her homework alone. She seems to understand because she never says to me: “teach me.” And sometimes when I ask her: “have you done this in class? She says “yes”. Then I left her alone to solve her homework because if she doesn’t do it means that she have been distracted (...).”*

—Caregiver, public school

However, although it’s not necessary that any household member help Andrea with her homework, it doesn’t mean that they don’t get involved in her education. In this regard, the mother points out her concern about her daughters academic performance and also mentioned that she is actively involved in the activities organized by the school, for example, in the parents meetings. When she was asked about this issue, the mother responded:

*“I attend to school programmed activities. Sometimes when I pick her up I see that she need to do her homework, I help her to copy, and I see what she is doing. So that way I’m seeing. Sometimes*

*I go to the principal's office to see what the teacher is doing (...). Constantly I don't go to the meetings but yes, if they were not on Tuesdays when I'm working I could go the next week. One day yes I can go and talk to the president, the treasurer and I ask them "how they are doing?"*

—Caregiver, public school

Related to what should be taught at school, the mother mentioned that she would like to devote a lot of time to teach children Math and Reading Comprehension and be taught courses related to art and theater.

*"A little more Reading and Math because I see that they are going around in the same thing (...). Let there be art, everything, of everything, that is what I would like ... that kids can do theater, what they like, what comes them natural because not everything is ... not everyone likes to write. It is the only way to get all the beautiful that each child has, to releases. Maybe one does not like to dance, perhaps he may like drawing or doing theater."*

—Caregiver, public school

On the other hand, it should be mentioned that while Andrea is doing well in school, she has not a good relationship with her teacher and suffers from school violence. In relation to this, the mother said that the teacher not only yells at her but also punished her physically.

*"He yells at her a lot, hits her with sticks. I'm tired of talking to the teacher. He hits her and denies it, that is a lie and that only corrects her a while. Sometimes she comes crying. I am worry about it, I'm looking at ways to change her classroom (...). She comes sad, sometimes crying. She says she does not want to go to school anymore."*

—Caregiver, public school

### **Juan**

Juan is 9 years old and attends fourth grade in a public school. Among his main responsibilities are to do his homework and keep up in his classes. His mom always tries to support him in his homework and if there is something he does not understand, he asks a family member to help him. Before the third round of qualitative YL was conducted, Juan was attending a private school. However, they changed it to a public school because in their previous school they did not get the vacancies required for his degree. Because of this and that no household member can take and pick him up from school, his parents decided to enroll him in public school located in front of his home.

*"Because the school is near and no one can take him to another school. I mean, I have no one who can take and bring him back (...). In that school were few children in second grade. For third grade, most children had already left so the teacher was not going to work with only one or two students. So they told me to take him to another school. Then I put him here because it is closer and in the second grade were very few children."*

—Caregiver, public school

Despite this, the mother of Juan mentions that the education provided in private schools is of a better quality than public because teachers care about the learning of children and involve parents in their education through the organizations of meetings where they are informed about their academic performance and how they can help them improve their performance.

*“The private school teaches much better because teachers are there with the students. Whatever happens, they you call. There are monthly or biweekly meetings. The teacher speaks to you and tells you “you have to help your child in this”. In contrast, in the state they don’t do that, only when there are activities, only for that the teacher calls you.”*

—Caregiver, public school

Specifically, in the public school where Juan currently attends, the mother mentions that education is not good because her child does not understand what they teach him and this is reflected in that sometimes he does not know how to solve his tasks. However, despite this she points out that he is doing well in school and get good grades, although his academic performance was better when he was attending the private school because teaching was more personalized. Moreover, the mother emphasizes that in private schools parents invest in their children’s education when they pay for a higher quality service. Therefore, it is a requirement that children receive a better education service, unlike public education which is free.

*“In a private school we can complain because we are paying to give us good service. In contrast, in a state school we cannot complain because it belong to the State and to dismiss or change a teacher is very difficult, you have to have someone who works in the Ministry of Education to help you because to dismiss a teacher is very difficult or change a teacher is very difficult. Whereas in a private school they are giving you good service, I mean the teacher has to give you a good service and the teachers that my son has had, they have been good.”*

—Caregiver, public school

Whilst the mother of Juan would like to change him to a private school again, she said that his son not only already adapted to the new school and their new classmates with whom he gets along but she also does not currently have the financial resources to do so. On the other hand, besides Math and Reading Comprehension, the mother would like them to teach children a trade that can serve them in the future if they do not get jobs.

### **Santiago**

Santiago is 10 years old, he is attending fifth grade in a public school. As previously described case study, Santiago used to attend a private school before. However, because the child had socialization problems and to economic factors, his mother decided to enroll him in public school near his home.

*“(....) His dad was not sending me the monthly payment at the time (...). My son attended preschool for 4 and 5 years in a private school, first grade he did it at a private school and second grade too. In third grade I changed him because in the private school were only three or four children as they were few children he was becoming selfish, he did not wanting to share things with anyone.”*

—Caregiver, public school

The school change during the first months was a difficult adjustment process because he passed from personal attention and education to a much larger room where he had to interact with more children. When asked about how well her son adapt to the new school, the mother said:

*“The first year he went to the new school, last year, he saw many children and was upset” You have put me in a school with many children, children bore me!” From a school of four children he went*

*to one of thirty—eight children (...).Get me out of school! He told me. Girls bored me, I do not like women!"*

—Caregiver, public school

The mother also mentioned that although his son took some adjusting to a new learning environment, is a good student and gets good grades. Furthermore she also appreciates that now he socializes more with the kids and plays with them.

*"With the change of school he got "A" and "B". And he got a "C" in behavior. Now this year that they have given me his notes, he also got "A" and "B". Now he is happy at school with the kids, sometimes he behaves well and plays with them."*

—Caregiver, public school

On the other hand, regarding her perceptions about the education her child receives, the mother emphasizes in the differences between public and private schools, noting that in private schools due to one must pay monthly they have to serve you better and even the teachers care and work harder for children to learn.

*"In a private school yes, teachers work harder, it may be because we pay."*

—Caregiver, public school

Martin is 10 years old, he is in fifth grade at a private school. His main duties and responsibilities are: getting good grades at the school and behave well. As his mother mentioned, she decided to enroll her son in a private school because education is not only more personal but also because teachers are better prepared compared to public schools.

*"Because there are few students and good teachers that is why I enrolled him at a private school. I really wanted to change him from school because sometimes the principal is very special and they are disorganized. Sometimes the teacher told me that they would have exam one day and she did not take it. And that I did not like, so I wanted to change him (...) But I spoke to the principal and SHE said "No, ma'am. We will talk with teachers to see what happens" And also the school was always dirty but I spoke to the principal and seems to be improving (...)"*

—Caregiver, public school

Overall, Martin's mother is satisfied with the education that her child receives in the current school he attends, mainly because he is doing well in school, gets good grades and the teacher is good with boys and girls.

*"Yes, Mom, they teach well, he tells me. Rather, he wants to stay in this school through high school (...) He has good grades. "They are teaching well, Mommy, he tells me. The teacher is good (...) he brings me twenties, nineteen, eighteen, seventeen. Rarely brings me fourteen, I do not know what he is thinking and he brings me fourteen. And I do not like that note, I tell him he has to bring twenties, nineteen."*

—Caregiver, public school

Also, the mother says that her son has a tutor that helps him solve his tasks and prepare for exams. In this regard, she also notes that his son has adapted without difficulty at school.

*“In primary school yes, I’ve been with him. As I said, I used to hit him because I was teaching him, he didn’t understand me and I felt very desperate. I said, “Sonny, do not you understand me? And like any mom, I do not know if I’ll be the only one, I despaired and wanted to hit him, so I said I better hired a tutor.”*

—Caregiver, public school

Moreover, regarding which other courses she would like to be taught in school to his son, besides Math and Reading Comprehension, the mother mentioned that she would like them to teach about moral values, give them guidance and advice.

*“I’d like to teach them more things ... about his personality, what is good, what is bad, that the teacher speaks to them (...). To be careful because I remember in high school, my school was a public one, there was always a teacher who spoke to us, she taught history. She always told me “you have to be careful, do not let anyone fool you” (...)”*

—Caregiver, public school

### **Celine**

Celine is 10 years old and is in fifth grade at a private school. However, from first to fourth grade he attended public school. Among his main responsibilities within the household are helping with the household chores to her grandmother and do her homework. Her mother describes her as a very loving girl. Celine’s mother decided to change her from a public to a private school because she perceives that private education is better than public, mainly because teachers are concerned about the learning of children.

*“(...) we make the effort, we paid, and they teach her better, the teacher cares for all students and in a public school is not like that (...). Now education in a public school is not the same. Time ago, teachers were concerned, students did well.”*

—Caregiver, public school

Celine’s mother also perceives private education as better quality because teachers do not absent or missing classes. It should also be mentioned that Celine is doing well in school compared to last year and gets good grades. Likewise, the mother said that at home they care about the education of his daughter and her academic performance. Therefore, they often have meetings with her daughter’s teachers to discuss about how she are doing in school. As in the case study described above, Celine also had trouble adapting to school. About what she would like her daughter also learn at school, the mother mention that she would like her daughter learn English because, in the future, it could provide her greater job opportunities.

*“Now I want her to learn English. Recently they are teaching, they are just beginning to teach English (...). They need to learn because maybe through that she can get a job.”*

—Caregiver, public school

Taking into account the case studies previously described, it should be noted that, in general there no exists significant differences between the cases analyzed mainly because children attending both public and private schools, not only haven’t had problems in adapting to primary education; but also have parents who are involved in their education and give them all the support they need; for example, in solving their homework’s. Also, they are actively involved in the activities organized by schools and

value the importance of parent meetings with teachers in order to stay informed about the academic performance of their children.

Moreover, the case studies previous analyzed allow us to understand that in the decision to whether enroll children in a public or private school, parents—especially those who send their children to a public school—take into account aspects such as the distance between schools and their homes as well as the confidence it generates to them because their other children also studied there. Nevertheless, it's noteworthy that, although children attend a public school, in most cases their parents perceive private education as better, possibly because there is a general belief that private education is of higher quality than public education. Among the most important reasons given by parents are the quality of teachers and the possibility that parents can demand for better services because they are paying for it.

In this regard, Cuenca (2013) notes that students enrollment in private schools is the result of a set of decisions that families make based on certain factors, highlighting that the quality of education offered in private schools is better not matter what. On the other hand, in the case of parents who send their children to private schools, they also perceived that private education is of better quality. Between the reasons given for believing in the superiority of private education are that teachers care more about children's learning and their academic performance.

It's also important to notice that most of the caregivers of children in public schools when were asked about what they would like their children learn at school, besides Mathematics and Reading Comprehension, highlighted that schools should raises their teaching standards for both courses as well as spent more time teaching these courses. This mean that according to parent's perceptions, children's learning and success at school is exclusively associated to cognitive measures. However, as we pointed out in previous sections, a child's socio-emotional development is as important as their cognitive development and also has implications for many domains of children's development (Saarni, Mumme and Campos, 1998).

## 6. Conclusions and Discussion

The present study had as objectives to examine the existence of cognitive and socio-emotional development gaps between public and private school children and to explore if these gaps could be reflected in different children's school experiences.

From a descriptive analysis, we found that there are important differences between children that attend private school and children that attend public schools. Children that attend private schools have, on average, a higher socioeconomic level, which is generally associated with better nutritional levels, a greater probability of attending preschool, a greater probability of having a mother with better education, among other variables. The fact that these variables may also have important effects over the child's future achievements is important in the process of estimating the effect of school type over cognitive and socio—emotional development. It indicates that we have to make sure that we are looking at differences between comparable children when analyzing the effects of school type over said variables.

Considering these results, we applied a PSM approach to find children with similar observable characteristics. We found statistically significant differences in cognitive development indicators between private and public school children both before and after the matching process. It was interesting to observe that the size of these differences decreased significantly when only comparable children were considered (from 0.87 the test's SD to 0.15 times). This supports the need to control for observable characteristics when comparing achievement levels between private and public school children.

When analyzing differences in socio-emotional development, we only found significant differences between private and public school children before matching (in all three indicators). Thus, we found no evidence that supports that there are differences in socio-emotional indicators that can be attributed to school type. These results also suggest that socio-emotional indicators are considerably affected by characteristics related to the child's socioeconomic level.

We also looked into the relationship between cognitive development gaps and socioeconomic level. We found that the differences in the PPVT score among private and public school children become larger with the child's socioeconomic level. We also found that the differences in the mathematics achievement test remain constant across socioeconomic levels. These relationships suggest that school type has a more homogenous effect over mathematical achievement across socioeconomic levels than over vocabulary indicators.

The reasons behind these differences could be many. The fact that school work has a direct effect on Mathematics test scores could explain how being in a private school affects consistently the score of the mathematics achievement test. The fact that school type effects over vocabulary indicators seem to change with socioeconomic level could suggest that, in order to have a significant effect over PPVT scores, it is required that the school's education has a higher quality (given that school's quality is associated with socioeconomic level). Given that this last difference could be attributed to school quality, it would be interesting to analyze the relationship between PPVT scores and private and public schools' characteristics.

On the other hand, using a qualitative approach, we found that parents—even those who send their children to a public school—perceived that private education is of better quality, compared to public education mainly because of a general belief that private education is better no matter what. Among the most important reasons given by parents for believing in the superiority of private education are the quality of teachers and the possibility that parents can demand for better services because they are paying for it. In this regard, parents perceived private education as homogeneous; however, as Cuenca (2013) pointed out, although the results obtained in private schools are consistently better than those achieved by students in public schools (as has been demonstrated by different national and international assessments), not necessarily students in private schools reach the expected levels. This means that private education quality in our country is not uniform and it depends on different factors such as socioeconomic status, for example.

Likewise, according to parent's perceptions, children's learning and success at school is exclusively associated to cognitive measures. Despite this, as has been mentioned in previous sections, child development is a multidimensional process that includes different dimensions and all of them are interrelated, being the child development an integral process (Myers, 1993). In this sense, a child's social-emotional development is as important as their cognitive development. Given that the child development is a multidimensional process, it is important to mention that the Ministry of Education through the strategy "Friendly School" is using a toolbox of socio-emotional development (*Caja de Herramientas Socio-Emocionales*) whose main objective is to transcend the cognitive level and promote skills that allow students to know and regulate themselves and also to improve their relationships with others.

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## Appendix 1

### Matching Results

Variables	Private School
Child attended preschool	0.012 (0.168)
Violence in 2009	0.005 (0.132)
PPVT Score in 2006	0.014*** (0.003)
Language PPVT (Spanish) in 2006	-0.240 (0.576)
Stunted in 2002	-0.163 (0.135)
Socio—emotional index (mother) in 2006	0.046 (0.057)
Academic expectation for child (mother) in 2006	0.231*** (0.076)
Mother's age in 2002	0.020* (0.01)
Caregiver has a partner in 2002	0.051 (0.139)
Caregiver's mother's language	-0.032 (0.140)
Mother has secondary education or more 2002	0.116 (0.114)
Household size in 2009	0.012 (0.27)
Birth order	-0.158*** (0.056)
Wealth index in 2009	2.895*** (0.402)
Child lives in the coast in 2009	0.197** (0.100)
Child's sex (male)	-0.072 (0.092)
Constant	-7.049*** (1.367)
Observations	1,171

Notes: Standard errors in parentheses. \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01.

## Appendix 2 Differences in Selected Variables Before and After the Matching Process<sup>1</sup>

Variable	Sample	Treated	Control	Bias	t	p>t
Child attended preschool	Unmatched	0.94	0.82	35.2	4.7	0.00
	Matched	0.94	0.93	1.2	0.2	0.86
Violence in 2009	Unmatched	0.15	0.14	2.7	0.4	0.67
	Matched	0.14	0.14	2.1	0.3	0.81
PPVT Score in 2006	Unmatched	45.48	30.90	94.7	13.8	0.00
	Matched	44.70	42.63	13.5	1.6	0.11
Language PPVT (Spanish) in 2006	Unmatched	1.00	0.98	13.6	1.8	0.08
	Matched	1.00	1.00	0	0.0	1.00
Stunted in 2002	Unmatched	0.10	0.24	-38	-5.4	0.00
	Matched	0.10	0.15	-12.1	-1.6	0.12
Socio—emotional index (mother) in 2006	Unmatched	0.50	0.10	45.1	6.6	0.00
	Matched	0.49	0.44	5.7	0.7	0.47
Academic expectation for child (mother) in 2006	Unmatched	15.90	15.34	54.1	6.9	0.00
	Matched	15.91	15.90	1.1	0.3	0.78
Mother's age in 2002	Unmatched	26.89	26.55	5.5	0.8	0.41
	Matched	26.74	26.81	-1.1	-0.1	0.90
Caregiver has a partner in 2002	Unmatched	0.87	0.87	-2.3	-0.4	0.73
	Matched	0.87	0.87	0	0.0	1.00
Caregiver's mother's language	Unmatched	0.88	0.79	25.8	3.7	0.00
	Matched	0.89	0.88	2	0.3	0.79
Mother has more than secondary education 2002	Unmatched	0.82	0.58	54.5	7.9	0.00
	Matched	0.82	0.77	10	1.3	0.20
Household size in 2009	Unmatched	5.02	5.22	-10.8	-1.7	0.10
	Matched	5.03	5.03	0	0.0	1.00
Birth order	Unmatched	1.75	2.34	-43.1	-6.1	0.00
	Matched	1.76	1.85	-6.1	-0.9	0.39
Wealth index in 2009	Unmatched	0.75	0.59	111.9	15.4	0.00
	Matched	0.74	0.73	6.2	1.0	0.33
Child lives in the coast in 2009	Unmatched	0.69	0.44	52.2	7.9	0.00
	Matched	0.66	0.63	6.9	0.8	0.42
Child's sex (male)	Unmatched	0.50	0.51	-1.8	-0.3	0.78
	Matched	0.48	0.49	-1.5	-0.2	0.86

Note: <sup>1</sup>: Results correspond to nearest neighbour matching with no outcome variable.

## Appendix 3 Score Distribution Before and After Matching

Figure A3.1—Score before matching

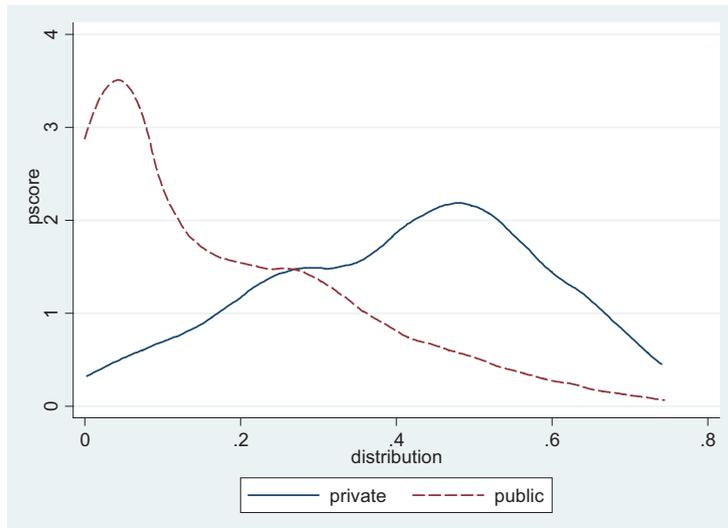
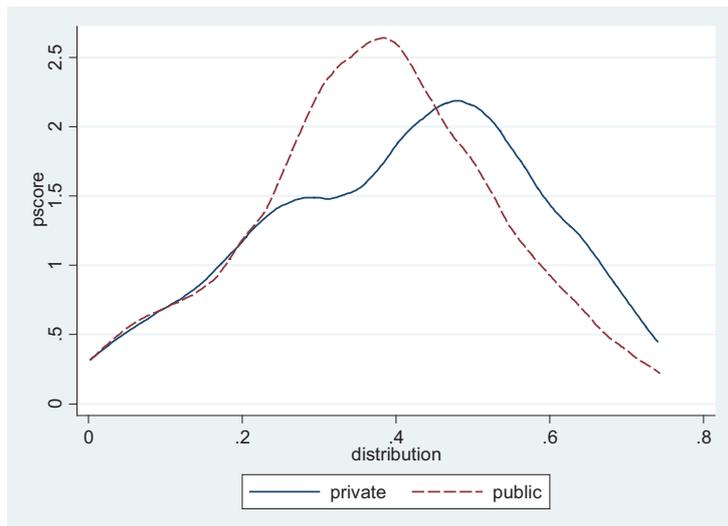


Figure A3.2—Score after matching











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