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Peer Effects and the Private School Learning Premium in Lagos

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We used data from a representative sample of public and private schools in Lagos state, Nigeria, to explore the effectiveness of low- and medium- cost private schools in producing English language outcomes. We described the scale of low- and medium-cost private schooling in low- and- middle income countries and provide descriptive statistics regarding the characteristics of students in private and public schools in Lagos. We found students in low and medium-cost private schools perform better on English language assessments in Lagos and this is particularly true for English as a Second Language students. Using a series of linear regression models and the Kitagawa-Oaxaca-Blinder decomposition, we found that private schools both attract students more likely to do well and are better at transforming these student endowments into better language outcomes. However, we found the composition of classrooms – specifically the share of students who speak English as a First Language – gender, wealth and age yielded significant results while attending a private school did not. While no model can fully capture the complexities of the various predictors of learning outcomes, our results suggested the private school learning gap is at least in part reliant on the provision of access to a different type of peer group.

Keywords: Schooling; English language proficiency; private schooling; language acquisition; education policy; education funding.

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Introduction

The claim that low- and medium- fee private schools in low- and middle-income countries (LMICs) outperform public schools has been made by a range of researchers (Tooley & Dixon, 2005; Shabbir, et al., 2014; Harma, 2015; Goyal & Pandey, 2009; Wadhwa, 2009; Mcloughlin, 2013) and media outlets (The Economist, 2015; Srivastava, 2015). While agreeing on the existence of a 'private school effect', each have differed in their claims regarding the size and importance of the gap.

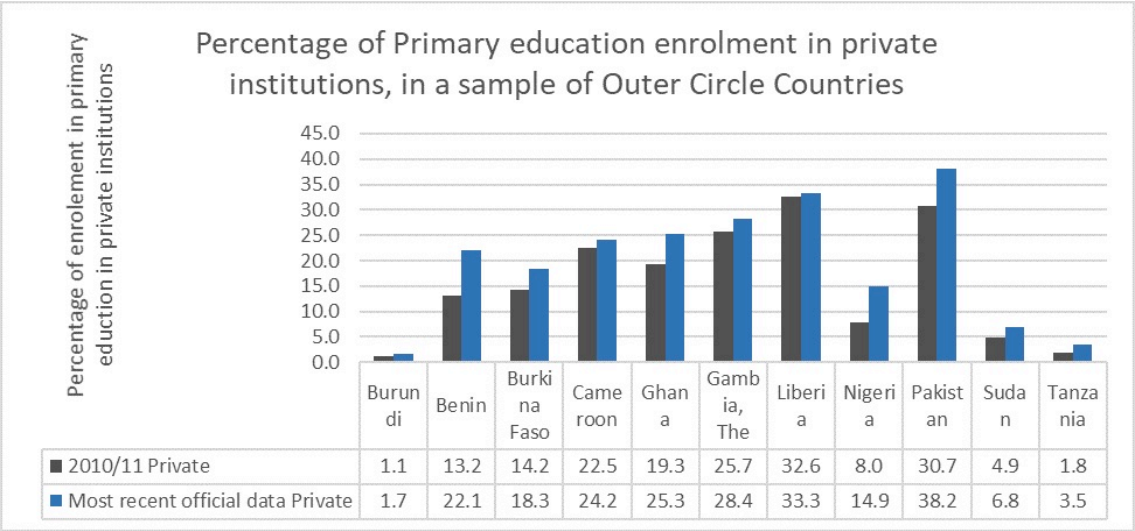
Private schooling in most high-income countries is primarily associated with serving the elite or the middle classes and tend not to focus on the poor. Conversely, a growing number of poor parents in LMICs are enrolling their children in low and medium-cost private schools (Tooley & Dixon, 2005, p. 1).

As can be seen in

Figure 1, the percentage of students enrolling in private institutions in a sample of developing countries showed increases of between .6 percent (Burundi) and 7.4 percent (Pakistan) between 2010 and 2015/16.

Sub-national enrolment rates in private institutions can be much higher. For example, while official statistics indicated approximately 15 percent of primary school students were enrolled in private institutions in Nigeria, the National Education Data Survey (NEDS) reports stated in southern Nigeria enrolment rates in private institutions reached 50 percent in 2015 (National Population Commission and the Federal Ministry of Education and the National Bureau of Statistics, 2015).

Figure 1 Percentage of primary enrolment in private institutions 2010/11 and official data (UNESCO Institute for Statistics, 2016)



	Burundi	Benin	Burkina Faso	Cameroon	Ghana	Gambia, The	Liberia	Nigeria	Pakistan	Sudan	Tanzania
2010/11 Private	1.1	13.2	14.2	22.5	19.3	25.7	32.6	8.0	30.7	4.9	1.8
Most recent official data Private	1.7	22.1	18.3	24.2	25.3	28.4	33.3	14.9	38.2	6.8	3.5

For those bringing evidence of a 'private school effect' in LMICs, the reasons constituting the performance gap have been primarily attributed to lower student-teacher ratios in private schools (Akaguri, 2014; Tooley, Dxon, & Stanfield, 2008; Tooley & Dixon, 2005; Harma, 2015), increased parental motivation in some studies (Archer, 2013) but not others (Muralidharan and Sundararaman, 2015), reduced teacher absenteeism in private schools (Chaudhury, Hammer, Kremer, Muralidharan, & Rodgers, 2006; Kingdon & Banerji, 2009) and lower rates of multi-grade teaching, longer school days, and higher teaching activity in private schools (Muralidharan & Sundararaman, 2015).

Across the majority of these studies the long history of theoretical work on language acquisition has been rarely brought to bear on the interpretation of school effectiveness, nor has the unique linguistic context of schooling in post-colonial states. In addition, while a large body of literature has evidenced the role of primary caregivers in language

development, relatively few studies have examined the relationship between children's language development and the language abilities of their peers. Even less so in LMICs. Yet the role of the cultural context and the unique role others play in the language acquisition of individuals, is of primary importance for comparisons between learning outcomes in public and private schools in LMICs.

Studies on the extent to which school or classroom composition – being, the characteristics of the students themselves - affect the educational attainment of individuals have predominantly been conducted in high-income countries. These studies have been predominantly interested in the role of peer effects to inform policies on the 'tracking' or 'streaming' of individuals into groups of similarly proficient peers.

Two articles published in the economics literature in the 1970's have provided emperical evidence on the existence of peer effects (Summers & Wolfe, 1977 and Henderson, Miezkowski, & Sauvageau, 1978). Using data from the United States of America (USA), both studies found differential peer effects depending on student ability. Similarly, Imberman et al (2012) found student achievement improving with high achieving peers and worsening with low achieving peers. The authors used data following the enrolment of Katrina and Rita evacuees across the USA Southeast in 2005.

Another study undertaken in the USA with pre-school children, found that after adjusting for a range of demographic and program-related factors, peers' expressive language skills made a unique contribution to children's receptive and expressive language achievement in the early years of language development (Mashburn, Justice, Downer, & Pianta, 2009). The study supported the theoretical evidence base that has emerged from the field of linguistics, stating that appropriately targeted comprehensible input (words able to be understood by the receiver), is the primary driver of language acquisition (Krashen S. D., 1982, p. 34; Brown, Cazden, & Bellugi, 1973; Reber, 1976; and Hall E. , 1959).

Moving beyond the evidence base from the USA, Zimmer and Toma's (2000) study across five countries (Belgium, the USA, France, New Zealand and Canda) explored differences in peer effects by school type. The authors observed a significant differential peer effect, stating that 'peers play a larger role in the achievement levels of low-ability students than they do in high-ability student achievement'. However, when exploring the robustness of the peer effect, Zimmer and Toma found less robust results by school type and argued for futher research on differences in public and private school peer efects.

To the best of our knowledge, Duflo et al's (2011) research on peer effects in Kenya is one of the only robust studies in LMICs on the topic. The study explored the impact of student tracking (or streaming) by proficiency levels. Duflo observed differential peer effects. Students at the top of the distribution (streamed into classes with similarly proficient peers) benefited the most, compared to non-streamed high performing students. Students in the middle of the distribution (streamed into classes with other average performing students) experienced no peer effects, compared to non-streamed students. Students at the bottom of the distribution experienced positive but not strong improvements compared to non-streamed low performing students. However, Duflo et al found the positive results for those at the bottom of the distribution was achieved through incentivising teachers to teach at the right level, rather than through a peer effect.

In this paper, we are interested in the role of peer effects in public and private schools in Lagos, with specific reference to their possible contribution to the private school learning premium. We review the societal, school and community level factors that predict language outcomes and analyse language outcomes in public and private schools in Lagos and their associations with these factors. Finally, we posit that the role of peer effects – being the unique contribution others make to an individual's language acquisition - in the unique socio-

linguistic settings of post-colonial states is important, yet under-explored, when interpreting the results of public and private school effectiveness.

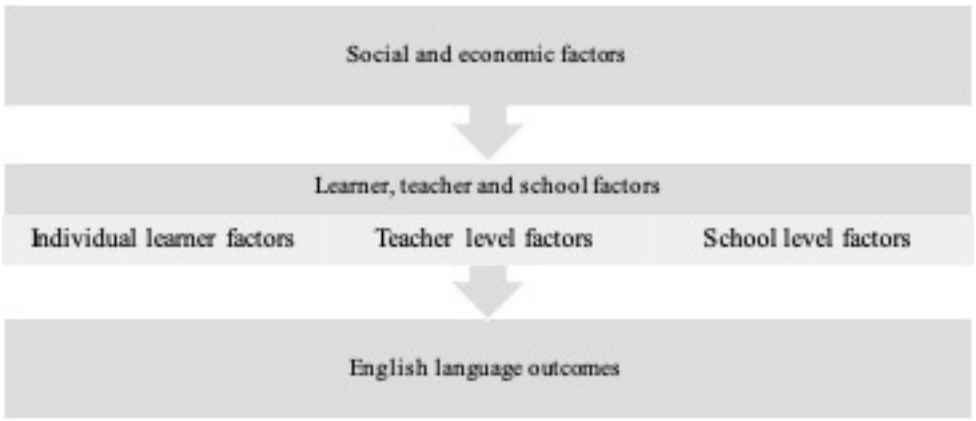
Materials and Methods

Theoretical framework

Learning outcomes are the result of a complex and multivariate set of factors both observable and unobservable, including (and not limited to): wider societal and national factors (Branigan, McCallum and Freese 2013), the schooling system (OECD, 2003), the characteristics of schools and teachers (both inputs and practices), and the characteristics (and practices) of learners (Hattie, 2009). The ways in which these factors operate and interact with each other are complex and can never be fully mapped or accounted for in an analytical set-up. Moreover, some of these factors are relatively more amenable to measurement compared to others.

Our theoretical framework is structured based on the broad categories of factors that influence language learning. However, we acknowledge the complexities of the various predictors of learning outcomes and recognise that no model can fully capture this complexity. Figure 2 summarises these categories.

Figure 2 Categories of factors that influence language outcomes



Broad social and economic factors and national planning and implementation can play a large part in improving learning outcomes (Bermeo, 2014). Social and sociolinguistic factors are especially important for English language outcomes. The sociolinguistic landscape within post-colonial countries tends to be both diverse and fluid. In countries previously colonised by the British, there is a growing population using English as the mother-tongue in the household (often in highly urbanised areas) and English language exposure and use tends to confound with socio-economic status.

At the school level factors that influence learning include the infrastructure within the school, teaching and learning resources, school leadership and the learning culture within the school (Hattie, 2009). The quality of teaching, collaboration and professional support between teachers, teacher classroom attendance and teacher feedback are examples of the teacher level factors that impact on learning outcomes (Hattie, 2009).

In the global literature, one of the biggest predictors of learning outcomes is what the students bring with them into the classroom. Intellectual, social and cultural factors, along with household-specific factors, significantly predict student performance in most standardised assessments (Hartas, 2011; Rolleston, 2014; Outhred and Beavis, 2012; Outhred and Beavis, 2013; Mayer, 1997; Dahl and Lochner, 2005). The international literature is broadly in agreement that family background factors powerfully influence student outcomes. Individual factors include gender, age, household wealth and parent's education.

Case study context

Lagos provides a rich case study as a typical context with all the factors associated with the proliferation of low-cost private schooling. Mclouglin argues that these factors include the perceived low quality of state schools, high population density, relatively high quality infrastructure and the availability of female secondary school leavers from government

schools (2013, p. 4). In addition, the parental demand for English language proficiency is high. The Economist (2015) claimed that in Lagos as many as 18 000 low-cost private schools were in existence, with hundreds more opening each year.

The definition of 'low-fee' is defined differently in different locations according to average household income and other economic factors. In this paper, the definition of 'low-cost' private schools is those charging parents NGN 50,000 or less (including fees and other expenses, but not transport) per annum. This figure converts to approximately USD$140 or less per year.

In 2006 approximately 61 percent of primary schools in Lagos were private low-cost schools, unapproved by the government (Gibson, Barlow, Cunningham, & Harma, 2011, p. 3). At that stage, researchers estimated the number of low fee private schools was growing by up to 1 000 per year (Gibson, Barlow, Cunningham, & Harma, 2011, p. 3).

The National Policy on Education (1998, 2004) in Nigeria states that the medium of instruction in the primary school should be the language of the environment for the first three years, with English being taught as a second language. From Primary Four, English is to be introduced as the medium of instruction (Federal Republic of Nigeria, 2004). However, the policy is often not implemented in schools due to '…the attitude of the educated class who will rather have their children taught English Language right from the cradle' (OlaOlorun, Ikonta, & Adeosun, 2013). For this reason, low and medium-cost private schools market the use of English as the medium of instruction, claiming this produces superior English language proficiency for students throughout primary school (Binci, et al., 2015, p. 54).

Data Collection

This paper uses data collected from a representative sample of Primary 4 students in Public and Private schools in Lagos.

The dataset used for this study did not include data on teacher level factors and limited school level factors due to the time and budget constraints of the funder for the original study. Instead, the study aimed to explore the complexities of how learner-level factors that predict English language outcomes interact with school factors. The learner and those school-level factors explored within each of these analytical categories are listed in **Error! Reference source not found.** below.

Table 1 Student-, teacher- and school-level factors investigated

Individual-level factors	School-level factors
Gender	School type (Public/Private)
Age	Location
ESL/EAL or EFL learner	Proportion of EFL learners in Grade level
Household wealth	
Parents' education	

1 374 Primary 4 students in Lagos, aged between 7 and 17 were administered an English language assessment and a student questionnaire in order to collect information on the background characteristics of students.

In collecting the data, we used a multi-stage sampling strategy, whereby Local Government Authorities (LGAs) represented strata that were used for an implicit stratification of the sampling frame (complete list of private and public schools in Lagos). Schools represent the primary sampling unit and were sampled using a Probability Proportional to Size (PPS) approach and students were listed in each sampled school and relevant grade and selected through a systematic random sampling procedure.

Given the need to obtain a balanced sample of public and low-cost private schools, 80 public schools and 103 private schools were sampled from within Lagos to achieve the desired sample size. Sampling weights were constructed in line with the sampling strategy and are used in the analysis.

The study aimed to administer tests to 8 students in Primary 4 per school (in some cases there were fewer than 8 students in each school). Children were randomly assigned to sit the English language test using sheets with numbers corresponding to student lists, placed in a hat.

In total, 1 374 students were tested in public and private schools in Lagos.

The English language assessment was aligned to the Nigerian English curriculum and administered one-on-one with students with enumerators using a Computer Assisted Programme Interface (CAPI) whereby enumerators led students through the assessment, and writing tasks were completed in a student booklet. One-on-one enumeration was required in order to assess reading fluency, listening and speaking. Written language was also assessed.

Instrumentation

We adapted the assessment from previous assessment instruments utilised in Nigeria through the Education Sector Support Programme in Nigeria over four years (Outhred et al, 2016). The psychometric properties of all items were analysed by a senior psychometrician, using R software. It was found that the assessments were sufficiently unidimensional to allow for the use of Item Response Theory (IRT). Scaled scores were developed on a scale with a global mean of 500 and standard deviation of 100 as reported in Allen (2016).

We assessed the reliability of the English Language assessment using Split-half Reliability, Cronbach's Alpha and Guttman's Lambda 4 reliability analysis. The analysis found that the assessment reliability was (a=.922); within an acceptable range for the test purpose (not high-stakes, population level research).

Based on questions in the student questionnaire, a Household Wealth Index (HWI) was computed by the researchers (Outhred et al, 2016), resulting in a HWI score per student. We had also been previously used and validated this measure in Lagos through the Evaluation of the DEEPEN programme in Lagos (Binci et al, 2015).

The variables of interest for this paper include English language proficiency, age, gender, EFL or ESL status, share of EFL students in grade, socio-economic status (SES), geographical location and school type.

Analytical techniques

The results are first reported in terms of descriptive statistics to provide a summary picture of the characteristics of the sample used in the analysis and their bivariate correlations with language outcomes to guide the identification of potential influencing factors to be included in a correlation analysis.

The correlation analysis regresses the identified 'explanatory variables' in a regression setting. The regression specification focuses on effects measured on the continuous English language scale scores, which provide an indication of the associations between learning and influencing factors. Specifically, the importance of belonging to a high or low HWI quantile for performing well in English language is assessed and the household education level is 'controlled for' in the regression specification. The location of the school and student's household is also controlled for in the regression specifications. We first regress the identified explanatory variables for the full sample to explore the relationship between individual and classroom factors, school type and learning. Secondly, we implement regressions for public and private school samples separately, so as to determine the magnitude and significance levels of any detected correlation between explanatory variables and English language outcomes separately on the sub-sample of students studying in the different school types.

In these regressions, we made use of cluster-level fixed-effects models at the Local Government Authority level. This fixed-effects model enabled us to control for all cluster (i.e. LGA) observable and unobservable characteristics at once, thus further isolating the effect of the remaining explanatory variables (e.g. HWI) from location-level confounders.

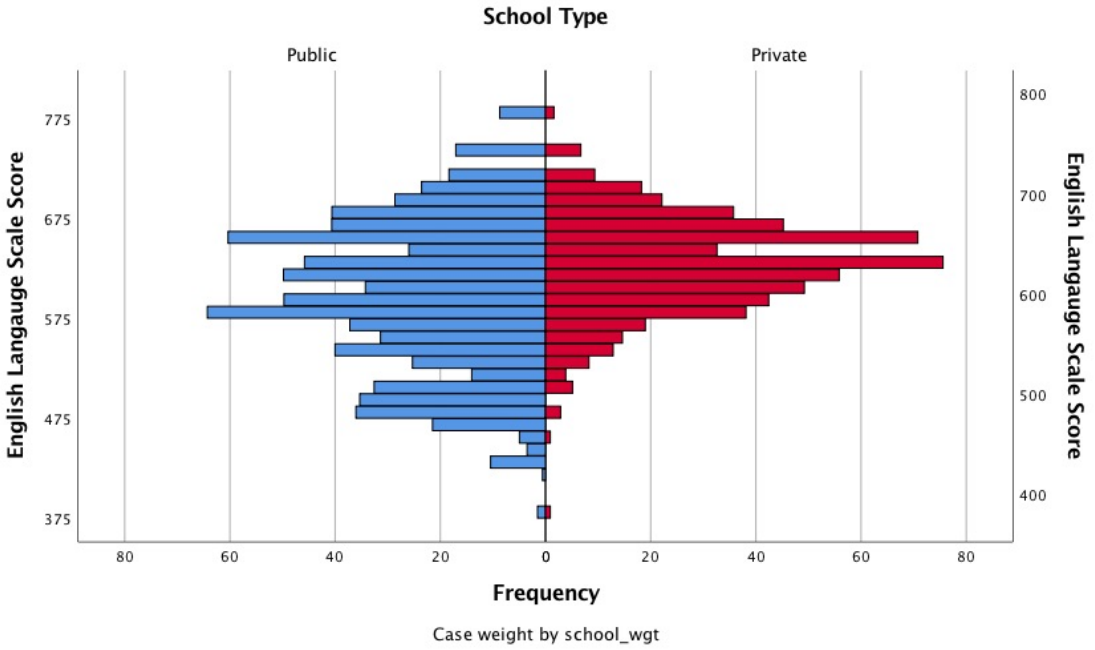
Finally, the Witagawa-Oaxaca-Blinder decomposition method was applied to identify the 'relative effectiveness' of private and public-school students. The method was introduced by sociologist and demographer Evelyn Kitagawa (1955) and later used by Ronald Oaxaca (1973) and Alan Blinder (1973) to investigate discrimination in the labour market. The decomposition method reveals how far the gap in English language proficiency can be explained by inequalities in, say, ESL/EFL status, rather than, for example, socioeconomic status. The decompositions we present were based on factors identified in the correlation analysis in the previous section. This analysis is purely descriptive, revealing the associations that characterise the gap.

Results

Descriptive Statistics

Our analysis found low and medium-cost private school Primary 4 students in Lagos have higher English language proficiency levels than their public-school peers (by, on average, 27 scale scores). The difference was significant ($t1358.293=8.946$, $p<.001$).

Figure 3 English Language scale scores for public and private schools



As can be seen in Figure 3, the range of student proficiency, as measured in English Scale Scores was similar in public and private schools. Students with the lowest levels of English proficiency could be found in both public and private schools, but in greater numbers in public schools. Students with the highest levels of English proficiency could also be found in both public and private schools.

A great proportion of students in private schools were female (54%) compared to public schools (49.7%). Being female was associated with a statistically significant ($t1381=3.226$, $<.001$) higher average scale score (approximately 12 scale scores).

As might be expected, the mean SES of students in private schools, as measured by the HWI was found to be higher than the SES of public-school students. The difference was significant ($t2425.824=16.982$, $p<.001$). Mean results by SES showed that less poor students had higher proficiency levels across SES tertiles and across school types, however, in each tertile, private school students out-performed their public school peers.

The average age of low and medium-cost private school Primary 4 students (just over nine years old) was approximately one year lower than the average age of public school P4 students (just over 10 years old). The mean difference in age reflected a high number of nine-

year-olds in private schools and a high number of 10-year-olds in public schools, but also the high number of older students enrolled in P4 in public schools. While there were very few students in private schools reaching the teenage years, there were students from the ages of 13 to 16 in Primary 4 in Lagos public school classes.

The affective state of age was an important, and not straightforward, factor in language acquisition. Age is generally a negative predictor of second language proficiency. In the field of linguistics, it is generally claimed that the younger a learner, the better the second language (L2) is acquired (Krashen, Long, & Scarcella, 1979). In addition, studies report an L1 acquisition 'lexical spurt' during early lexical development. The same has not been observed in L2 adult learning but has been observed in early L2 acquisitions (Wode, et al., 1992; Ellis, 2003), pointing again to age as a negative predictor of language outcomes.

The greater number of teenagers observed in the public school sample was worth noting when reflecting on the evidence on language development and maturation. The evidence base was in strong support for the notion that maturational constraints impede the completeness of L2 language learners who learn after puberty (Lenneberg 1967; Penfield and Robertson Hahne and Friderici 2001; Johnson and Newport 1989).

In this study, age was also a negative predictor of language, as differences between younger (10 years old and younger) and older private school students were significant ($t570=2.053$, $p<0.05$), with younger students scoring higher. The same difference was observed between younger and older public-school students ($t260.758=3.543$, $p<0.001$). However, differences in scores between older (over 10 years old) private school students and older public-school students were not significant ($t178= 1.159$, $p>0.05$).

More parents of Primary 4 students in Lagos private school had completed primary education (90.6%) compared to their public school peers (88.7%). The difference was small, but significant ($t2610=-1.736$, $p<0.001$). On average, students with parents who had

completed primary education achieved approximately 12 scale scores higher, however this difference was not statistically significant ($t1305=-1.957$, $p>0.05$).

Figure 4 shows that, on average, both public and private school students who spoke English as the main language outperformed their in-school peers who spoke languages other than English as the main language in the home. Our analysis also found a small (approximately 9 scale scores) but insignificant difference ($t446=-1.620$, $p=.106$) between the average English proficiency of students who spoke English at home in public schools and the average English proficiency of students who spoke English at home in low and medium-cost private schools.

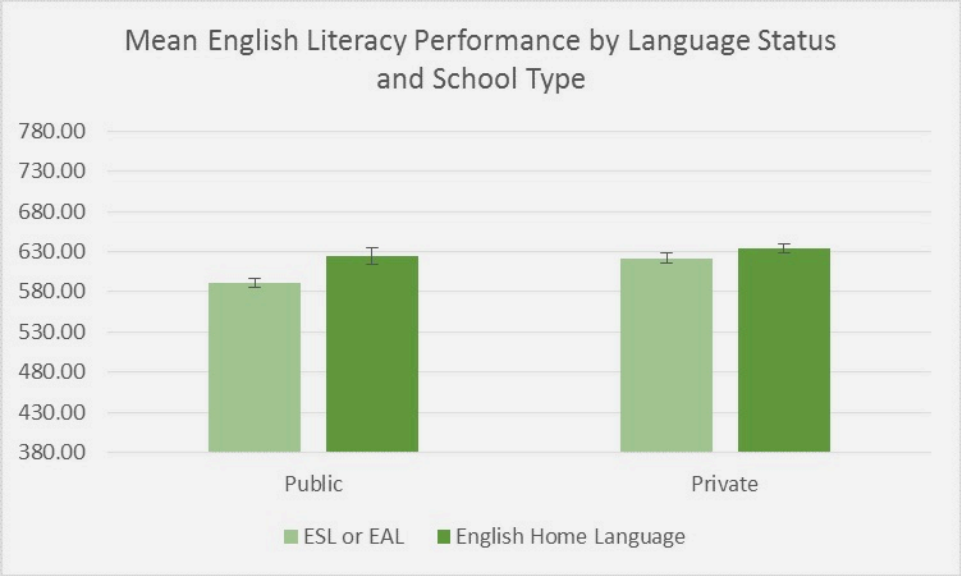
These results were not surprising. First language learners are exposed to language from parents and caregivers from a young age and language development is scaffolded (Tomasello, 2000). However, for second language learners, exposure to the target language is varied in both quality and quantity (Chenu & Jisa, 2012). An analysis of student's home language found a great deal of linguistic diversity across public and low and medium-cost private schools in Lagos, with students speaking a variety of different languages in the home in both school types. L1 languages across public and private schools included Benin Edo, English, Hausa, Igbo, Ibibio, Yoruba and other minority languages. In private schools the majority of students spoke English at home (52%), while in public schools, the majority of students spoke Yoruba at home (57%). In public schools only a fifth of students (19%) spoke English at home.

The differences between first and second language acquisition are important in this case, in that first language acquisition is instinctual (Pinker, 1995), rapid (Saffran & Griepentrog, 2001; Aslin, Saffran, & Newport, 1998; Saffran, Aslin, & Newport, 1996; Saffran, Johnson, Aslin, & Newport, 1999), complete (Snow & Hoefnagel-Hohle, 1978) and natural (Saffran, Senghas, & Trueswell, 2001). Conversely, second language acquisition

requires motivation (Dornyei, 2005), is never as quickly acquired as the first language (L1) and is never as complete as the L1 (Abrahamsson & Hyltenstam, 2009).

In our analysis, we found that students who spoke languages other than English at home average over 30 scale scores higher in private schools than public schools. This difference was significant (t755.027=7.243, p<0.01).

Figure 4 Mean English Scale Score by Language Status and School Type



The large and significant difference between ESL speakers in public and private schools pointed to school level factor/s uniquely associated with the individual status of being an ESL learner. Potential factors included a focus on English instruction within private schools and/or the peer effects of a majority English-speaking student body in private schools.

The field of linguistics provides some explanation regarding the complexities of how individual, group and school effects interact and engage with one another regarding second language acquisition. Motivation is identified as a key factor, as motivation drives behaviour and provides persistence and direction to the language learner (Reeve, 2013). In this way, for

second language learners the perceived value of, interest in and attitude towards the target language predicts performance (Dornyei 2005 and Kormos and Csizer 2008). However, perceived value, interest and attitudes are also shaped by the nature of interaction with significant others, the learning enviornment and the broader external context (Williams et al, 2001).

Fanselow and Long's (1977) work on error correction, the evidence from children's first language acquisition (Brown, Cazden, & Bellugi, 1973) and, specifically, the (limited) role of schooling in first language acquisition (Reber, 1976; Hall E. , 1959) also point to peer effects as a viable contributor.

Language acquisition for ESL learners is developed through the 'imitation' of utterances and this is the primary factor in bringing about fluency. Structured learning provides a *monitoring* or *editing* of these imitated utterances. Therefore, conscious and structured language learning are hypothesised to play a much smaller role in second language proficiency than previously thought (Krashen S. D., 1982). Muralidharan and Sundararaman's (2015) study supports this view, reporting results from a randomised controlled trial of a school voucher experiment in Andhra Pradesh, India. The authors found that private schools spend significantly less instructional time on native language instruction (Telugu) than public schools, and instead spend more time on English. The authors found that this did not translate to statistically significant differences in learning outcomes for English or Telugu.

In our study, mean differences in language proficiency could be observed by the share of EFL speakers in the grade (using tertiles 0-33.3%, 33.4-66.6% and 66.7-100%). Students with the fewest English-speaking peers scored approximately 32 scale scores lower than those belonging to the middle tertile. This difference was significant ($t1250=-8.228$, $p<0.01$). The difference was less pronounced and not statistically significant ($t559=-1.034$, $p>0.05$) for

medium tertile students and those with the vast majority of their peers speaking English as a first language, with an average difference of 6 scale scores.

There was no statistically significant difference in English language proficiency between low or medium fee private schools attendees.

The table below provides summary statistics of the mean English language proficiency scores in public and private schools, by individual and school characteristics.

Table 2 Mean English language scale scores by individual and school characteristics

	Public			**Private**		
School type	597.6			628.1		
Gender	*Female*	*Male*		*Female*	*Male*	
	609.2	592.3		631.1	625.1	
Age	*Over 10*	*Under 10*		*Over 10*	*Under 10*	
	589.9	615.7		613.5	635.3	
Parent is educated	*Yes*	*No*		*Yes*	*No*	
	601.2	596.8		630.7	618.82	
EFL status	*EFL*	*ESL*		*EFL*	*ESL*	
	624.9	591.2		633.9	621.8	
Student's wealth tertile	*Most poor*	*Medium*	*Least poor*	*Most poor*	*Medium*	*Least poor*
	584.3	607.3	616.6	618.1	623.8	637.7
Share of EFL students in grade	*0-33.3%*	*33.4-66.6%*	*66.7-100%*	*0-33.3%*	*33.4-66.6%*	*66.7-100%*
	591.8	623.9	(low N)	615.4	631.4	637.2

Mean differences Note: Stars denote significance levels of correlations associated with p-value at 1% (***), 5% (**) and 10% (*). Parent is educated = 1 if father/mother/guardian (in this order of priority) went to school and completed primary education.

Correlations

Bivariate correlations with each of these factors and English language proficiency across the full sample of students revealed the share of EFL students in the grade had the strongest association with language proficiency. This was followed by student's school type, the age of the student, wealth, speaking English as a first language and gender. All of these results were significant at the 0.01 level.

Table 3 Bivariate correlations with English Language Proficiency

	Bivariate correlation with English language proficiency	**N**
Private	.220***	1383
Student is male	-.123***	1383
Age of student	-.219***	1379
Parent is educated	.042	1307
Student's wealth tertile	.215***	1307
EFL	.209***	1382
Share of EFL students in grade	.261***	1383

Note: Stars denote significance levels of correlations associated with p-value at 1% (***), 5% (**) and 10% (*). Parent is educated = 1 if father/mother/guardian (in this order of priority) went to school and completed primary education.

Econometric Linear Regression

The econometric model of linear regression[1] assesses the statistical level of the significance of the detected correlations between English language proficiency and their influencing factors.

We ran a linear regression, with LGA, school type, gender, age, wealth, parental education, EFL status and share of EFL peers in the classroom. The regression was run once for the full sample of students and once for a sample restricted to ESL students only, to understand the correlations between English language proficiency and their influencing factors for different types of language learners.

As can be seen in Table 4, we found that attending a private school did not yield a significant correlation with Primary 4 language outcomes, while gender, age, share of EFL peers in the classroom and the student's wealth at the medium and top wealth tertiles significantly correlate with Primary 4 language. In addition, some interesting trends emerge with regard to the magnitude of the correlations for each group. Being male and being older were negatively correlated with English proficiency and the magnitude of these correlations

[1] Ordinary Least Squares (OLS).

were stronger for ESL students. Unsurprisingly, the magnitude of the correlation between share of EFL peers and English language proficiency was greater for ESL students.

Table 4 Linear regression model including share of EFL peers for P4 literacy in all schools

	Column A **All schools**	**Column B** **All schools**
School is a private school	2.105	2.742
	(4.675)	(6.052)
Student is male	-15.653***	-20.097***
	(3.522)	(4.59)
Age of student	-6.24***	-7.957***
	(1.258)	(1.567)
Share of EFL peers in classroom	34.633**	43.794**
	(11.055)	(14.847)
Student's parent is educated	3.509	2.028
	(5.796)	(7.45)
Student's household belongs to medium wealth tertile	14.583**	15.431**
	(4.433)	(5.507)
Student's household belongs to top wealth tertile	22.367***	23.319***
	(4.571)	(5.938)
Constant	639.482***	655.308***
	(15.392)	(19.279)
Sample restricted to ESL students	No	Yes
N	1312	872
R2	1.42	.135

Note: Stars denote significance levels of correlations associated with p-value at 1% (***), 5% (**) and 10% (*). Parent is educated = 1 if father/mother/guardian (in this order of priority) went to school and completed primary education.

We then ran the model for public and private schools separately first with and without location specific controls[2] (See Annex: Columns A and C in

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[2] Cluster LGA level fixed effect, which controls for all LGA-level fixed effects, which controls for all LGA-level observable and unobservable characteristics..

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Table 7, and Columns B and D in

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Annex

Table 7 respectively).

Attending a private or public school in different parts of Lagos is shown in our analysis to matter significantly when it comes to students' English language outcomes. Interestingly, when estimating our correlation model with these location specific controls,[3] the effect of the other individual variables, such as socioeconomic status and parental education, was reduced and lost statistical significance. This suggested that the features (economic as well as cultural and linguistic) defining each LGA broadly captured the main factors, that were individually described by our larger set of explanatory variables. This suggested that belonging to a wealthier neighbourhood where English is likely spoken more frequently was of critical importance for schools and students to perform well in terms of English language proficiency. Although the econometric model employed did not allow us to investigate the specific community-level factors contributing to this, it was reasonable to assume that they encompassed social, socio-linguistic and economic factors as well as cultural aspects.

On this basis, we ran the model for public and private schools separately with location specific controls[4], with the full sample of private and public schools respectively and with the regression results restricted to the sample of ESL students, in private and public schools. In Table 5, Columns 1 and 2 report the regression results for the full sample of private and public schools respectively. Columns 3 and 4 in report the regression results restricted to the sample of ESL students, in private and public schools respectively.

[3] Cluster LGA-level fixed effects, which controls for all LGA observable and unobservable characteristics.
[4] Cluster LGA level fixed effect, which controls for all LGA-level fixed effects, which controls for all LGA-level observable and unobservable characteristics.

Generally, language outcomes in both public and private schools were found to be correlated with belonging to the top tertile of socioeconomic status as defined by the HWI, with the exception of ESL students in private schools. There were interesting differentials within this general trend. In particular, in public schools the correlation were stronger. On the contrary, the magnitude of the correlation coefficient between the English language outcomes of private school students and belonging to the top wealth tertile was smaller and not significant for ESL private school students.

On the basis of the correlation analysis, gender emerged as a particularly important factor in being associated with English language outcomes in public schools across all our models. Specifically, boys were found to perform significantly worse than girls. The same pattern was visible in private schools, although the magnitude of the correlation coefficient was smaller there.

Age did not have any statistically significant correlation with English language in either school type. Notably however, while age was positively correlated with performance in private schools, it was negatively correlated with performance in public schools.

When controlling for other potential confounding factors in our regression analysis, parental education emerged as not being significantly correlated with English language outcomes.

What emerged consistently across our models was that the share of EFL peers was positively but insignificantly correlated with performance in public schools, and positively and strongly significantly correlated with performance in private schools. This suggested that students' English language performance may be influenced by the share of EFL peers to a larger extent in private schools than in public schools.

Table 5 LGA cluster fixed-effects model for P4 literacy

	Private school full sample	**Public school full sample**	**Private school ESL sample**	**Public school ESL sample**
Student is male	-9.239**	-19.712***	-12.869**	-21.466***
	(3.848)	(6.275)	(5.069)	(6.694)
Age of student	30.093	-18.420	8.4	-7.967
	(27.915)	(15.674)	(44.424)	(17.443)
Age squared	-1.778	0.481	-0.879	0.049
	(1.389)	(0.706)	(2.154)	(0.785)
Share of EFL peers in classroom	0.397***	0.364	0.722***	0.123
	(0.147)	(0.304)	(0.179)	(0.338)
Student's parent is educated	6.929	-0.551	9.781	0.252
	(5.635)	(10.545)	(7.111)	(11.948)
Student's household belongs to medium wealth tertile	-0.651	13.984	-3.302	13.986
	(6.005)	(8.520)	(8.108)	(9.443)
Student's household belongs to top wealth tertile	9.740**	19.027**	1.037	25.366**
	(5.672)	(10.239)	(7.766)	(11.297)
Constant	459.991***	711.955	586.592**	649.738***
	(140.292)	(87.887)	(226.705)	(98.340)
LGA effects	Yes	Yes	Yes	Yes
Sample restricted to ESL students	No	No	Yes	Yes
N	551	761	265	607
R2	0.202	0.207	0.283	0.204

Note: Stars denote significance levels of correlations associated with p-value at 1% (***), 5% (**) and 10% (*). Parent is educated = 1 if father/mother/guardian (in this order of priority) went to school and completed primary education.

'Relative effectiveness' of private and public-school students

In utilising the Kitagawa-Oaxaco-Blinder decomposition to construct a direct comparison of the relative significance of individual factors in explaining the gap in performance between private and public schools, the gap in performance was separated into two parts. Firstly, the part due to differences in endowments (the explained part of the decomposition); and, secondly, the part due to differences in the returns to those endowments

(the unexplained part). For example, children attending private schools may perform better not only because they come from better-off families – therefore giving them access to better schools – but also because being from a better-off family in a private school gives them additional advantages in learning (e.g. through peer effects). The method allowed us to separate the part of the gap due to the specific characteristics of students (e.g. socioeconomic status) – their endowments – from the part which was due to differences in how well schools convert student and household characteristics into learning outcomes – the returns to endowments. Thus, the Oaxaca-Blinder decomposition method standardises the test scores and determines what percentage of any gap in achievement between public and private school students was due to student intake and what percentage could be explained by school effects.

The analysis showed both endowments and the returns to those endowments contributed to widening the achievement gap between private and public schools. The gap was defined as the difference between mean outcomes between public and private schools. The negative overall gap between public and private school performance in Table 4 (the sum of the explained and unexplained components) illustrates our findings that English language outcomes were significantly better in private schools compared to public schools.

Table 6 Oaxaca-Blinder decomposition results

	Explained (endowments)	**Unexplained** (returns to endowments)
Overall gap (public-private)	19.184***	9.625**
	4.230	4.545
Student is male	0.331	6.213
	.526	4.125
Age of student	8.167***	39.048
	2.143	32.563
Student speaks English	5.198***	-3.752
	1.482	3.188
Student's parent is educated	.0278	13.434
	.203	10.742

Student's household belongs to medium wealth tertile	-0.515	-4.842
	.517	3.328
Student's household belongs to top wealth tertile	5.974***	-5.344
	1.577	4.371
Constant	35.132	
N	1,296	

Both the characteristics of the initial intake cohort (endowments) and the school effect (returns to endowments) widened the gap between private and public school performance for English Language outcomes. This meant that private schools both attracted students more likely to do well *and* were better at transforming these student endowments into better learning outcomes. The two parts of the gap were almost equally important and significant in explaining the differences in English language performance.

The most significant contributor to differences owed to endowments was belonging to the wealthiest group and speaking English at home. These factors were significantly correlated with better learning outcomes, more likely to be found in private schools, and therefore significant determinants of the gap in English language outcomes.

Discussion

In Lagos, on average, low and medium cost private school learners are more proficient in English language than their public school peers. However, public school learners who have been exposed to English as their L1 (EFL learners), on average, have smaller differences in their levels of proficiency as their EFL private school peers.

While our model lacked teacher level data, our analysis showed that the associations between a private school education and language outcomes are not straight forward in the complex linguistic landscape of Lagos, Nigeria.

We found classroom composition, gender, wealth and age yielded significant results while attending a private school did not. Our analysis showed differential trends in how individual and school factors interacted with English language learning in public and private schools and differential trends for ESL students within public and private schools.

Our analysis also showed that private schools both attract learners more likely to do well and are also better at transforming student endowments into better learning outcomes. While there was insufficient data to identify exactly how these transformations took place, our results suggested that the private school learning gap was at least in part reliant on the provision of access to a different type of peer group, and that this benefits ESL students the most. The role of peer effects in generating the private school premium is of critical importance regarding the scalability of the "private schooling effect".[5] For example, if peers are the primary source of comprehensible input, the extent to which private schooling can be scaled up and retain the same 'advantage' in English language proficiency, is limited due to the limited number of EFL speakers in the population.

The vast majority of the literature on peer effects is concerned with the effect of tracking or streaming students by ability levels. The role of peer effects in producing differential outcomes for students enrolled in public and private school is an important and underexplored area, particularly in LMICs.

Our findings indicate that in addition to the well known factors of gender, wealth and age, classroom composition and access to a different type of peer group explains, at least in part, higher language learning outcomes in private schools.

We would like to acknowledge Oxford Policy Management for allowing us to use the data developed as part of the Lagos Public and Private School study undertaken in 2016.

[5] Importantly, the scalability of the observed effect is different to scalability of private schools themselves, which have and are scaling at a rapid rate, as outlined in this paper.

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Annex

Table 7 LGA cluster fixed-effects model for P4 literacy in public and private schools

	Column A **Private school sample**	Column B **Private school sample**	Column C **Public school sample**	Column D **Public school sample**
Student is male	-8.802**	-8.315	-18.607***	-20.884
	(-3.82)	(4.096)	(-6.265)	6.560
Age of student	31.664	43.035	-15.679	-18.708
	(-28.67)	(33.948)	(-15.352)	(18.428)
Age squared	-1.864	-2.417	0.371	0.475
	(-1.434)	(1.710)	(-0.686)	(0.841)
Student's main language is English	9.226**	11.844	16.397**	21.891***
	(-4.238)	(4.812)	(-7.434)	(7.954)
Student's parent is educated	6.772	7.631***	-0.857	-5.367
	(-5.821)	(5.970)	(-10.26)	(10.725)
Student's household belongs to medium wealth tertile	-0.16	4.256**	13.957	19.049**
	(-5.981)	(6.039)	(-8.586)	(8.989)
Student's household belongs to top wealth tertile	11.164**	16.710***	18.404**	28.621***
	(-6.035)	(6.549)	(-10.242)	(9.784)
Within LGA Fixed Effects	Yes	No	Yes	No
Constant	463.496***	422.523***	697.548***	739.803***
	(-143.563)	(168.612)	(-86.395)	(102.066)
N	551	551	761	761
R2	0.193	0.077	0.221	0.100

Note: Stars denote significance levels of correlations associated with p-value at 1% (***), 5% (**) and 10% (*). Parent is educated = 1 if father/mother/guardian (in this order of priority) went to school and completed primary education.