What do you mean by 'good'? The search for exceptional primary schools in South Africa's no-fee school system

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Abstract

This paper describes a rigorous data collection process to find and verify the quality of what could *potentially* be high-functioning or high-performing schools accessible to the poor in three of South Africa's nine provinces. A potential sample of 'outlier' schools is selected using system-wide Universal Annual National Assessment data corroborated against school recommendations collected from a variety of system actors expected to be informed about school quality. Unfortunately, literacy testing in 31 purposively selected schools yields no example of high-performing, no-fee schools. However, we identify outlier or resilient students even in underperforming schools. Furthermore, within the no-fee school system there exists a continuum of functionality. Schools exist that while far from reaching good (or even adequate) median levels of English literacy, exhibit relatively higher literacy levels than other sample schools after controlling for student background differences. The presence of these relatively better performing sample schools (and performance variation more generally in the no-fee system) suggests that there is a middle-ground, a rightward movement away from dysfunction that can be reached. However, it is not clear that all system actors are able to detect variations in school quality. Our sample of respondents recommending 'good' schools are only able to identify slightly better performing no-fee schools. For certain groups, specifically education district officials, enrolment growth appears to be a better indicator of their perceptions of 'good' than measures of student performance.

JEL codes: I20, I21

Preliminary findings from the project entitled "Succeeding Against the Odds: Understanding resilience and exceptionalism in high-functioning township and rural primary schools in South Africa".

I. Introduction

The dire state of basic education in South Africa is undeniable. Since the start of our participation in international testing in 1995, we have become accustomed to the disconcerting reality that South African children are consistently ranked last or near to last in international tests of reading literacy and numeracy (Howie et al., 2017; Reddy et al., 2016; Zimmerman et al., 2012). The most recent 2016 Progress in International Reading Literacy Study (PIRLS) results indicate that 78% of children cannot read for meaning (Howie et al., 2017). In this context, it is useful to ask whether there are exceptions to the norm; schools serving the poor that produce at least adequate levels of learning. The presence of more functional schools can provide "best practice" examples from which policy-makers, districts, school managers and teachers may learn and emulate these in under-performing contexts. In a seminal work identifying unusually effective schools in the United States, Klitgaard and Hall highlight the policy relevance of this question:

> *"Do some schools consistently produce outstanding students even after allowance is made for the different initial endowments of their students and for chance variation?" This is an important policy question. Even if unusually effective schools are rare, so long as some exist and can be identified there is hope that their superior performance might be replicated throughout the educational system. But if no exceptional schools exist, we may have to consider alternatives radically different from present attempts to discover and diffuse "best practice". We may need to make substantial changes in educational expenditures, or even overhaul the entire educational system. Thus, investigating the existence of unusually effective schools is not merely a matter of scientific curiosity, but a necessary foundation for a rational public policy toward educational improvement"* (Klitgaard and Hall, 1973, pp. 3–4).

This paper describes a process of identifying and verifying the quality of what could potentially be high-performing primary schools for the poor in three of nine provinces, the starting point for a DFID/ESRC funded project entitled "Succeeding Against the Odds: Understanding resilience and exceptionalism in high-functioning township and rural primary schools in South Africa". Identifying outlier primary schools has been an underexplored issue in South Africa due to the lack of data to identify primary school performance on a large scale. By contrast, "Schools that work" at the *secondary* level have received a priority focus with matriculation data to identify these schools (Christie et al., 2007; Department of Basic Education (DBE), 2017; Jansen and Blank, 2014). But these stories of so-called best practice may be a function of selection effects, student background factors playing a larger role than schools themselves. Significant dropout which occurs at higher grades, and weeding out of underperformers in schools (Hunter, 2015), makes these apparent outlier secondary schools much easier to identify than at the primary level. If poorer schools are indeed serving the poor, they need to be found at lower grade levels after accounting for student background effects. However, it remains possible that there may be deserts of access to quality primary schooling, as evidenced for example in a search for quality schools in Guinea Bissau, West Africa (Boone, 2013).

At the outset, it is important to clarify that this paper does not consider private sector provision of schooling. This contrasts with the increased proliferation of developing country studies on school choice as a policy relevant lever for learning improvements, particularly with respect to burgeoning private sector school provision, how access to private institutions impacts on learning outcomes and in modelling demand for schools (Carneiro et al., 2013; Day Ashley et al., 2014; Glick and Sahn, 2006; Schneider et al., 2006). While there is considerable anecdotal mention of how the private schooling sector is growing in South Africa, providing alternate schooling options for the poor, this sector in fact remains very small serving at most 5% of all registered school-going students in 2016

(Department of Basic Education (DBE), 2016a).[2] The largest proportion of South Africans are schooled in no-fee schools, and continued system improvements requires a ratcheting up of quality here. In this context, the paper prioritises the following overarching question: *Are there quality no-fee public primary schools in South Africa*? For this study, the search is limited to three provinces - Gauteng, KwaZulu-Natal, and Limpopo – each with their own unique characteristics and varying levels of administrative functionality.[3]

The next section provides a discussion on existing studies of school quality in South Africa. Section III then describes the process of searching for potential outlier schools accessible by the poor. Schools' Universal Annual National Assessment (U-ANA) data for the years 2012-2014 is corroborated against collected recommendations of 'good' schools from various system actors to establish a sample of 31 potential outlier schools. The method and data section maps out in detail the selection process, data used and collected to identify these schools.

Section IV then discusses the outcomes of the quality verification process, namely testing English literacy proficiencies among grade 6 students in the 31 potential outlier schools and 30 additional matched pairs. In benchmarking these schools' performance, our grade 6 sample is juxtaposed against students from other lower to upper middle-income countries that wrote the same released items in previous rounds of the PIRLS. In summary, we fail to find quality no-fee primary schools that are performing at levels comparable to other lower to upper middle-income countries. However, within the student sample (augmented through the inclusion of 30 additional typical or underperforming schools to support a matched pair analysis), there are a handful of more functional schools with regards to developing English language proficiencies. A residual analysis, similar to that used by Klitgaard and Hall (1975), indicates that higher English literacy outcomes in these more resilient schools is not merely the result of differences in student background but a school effect is most likely present.

Albeit there being no evidence of best practice examples in an international comparison, variation does exist within the no-fee sector. Some schools are more efficient than others at producing literacy outcomes given the background of the students they serve, indicating that progress is possible. However, the analysis of section V casts doubt on whether certain system actors can detect these quality differentials. A purposeful selection process was used to obtain recommendations on potentially 'good' schools in rural and township areas from groups and peoples likely to be more 'in-the-know' about school performance. This alternative data source lends some specificity to how perceptions of school quality align with actual school performance.

II.   Background: Existing research on school quality in South Africa

It is important to qualify that South Africa does have quality, well-resourced public schools that are performing at or above low international benchmarks of learning. But this is typically a fee-charging system of schools that only reaches about 10-15% of school-goers and has historically served a privileged white (and to a lesser extent Indian) population who were favoured under Apartheid. Evidence of increased racial integration in former white and Indian schools along with small-scale quantitative and qualitative studies on school choice patterns indicate that some less advantaged

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[2] Until recent developments with the piloting of 'collaboration' schools in the Western Cape, charter-like schools have not existed in South Africa. For a dedicated discussion on low-fee private schooling in South Africa the reader is referred to van der Berg *et al* (2017).

[3] In South Africa, national government determines policies and oversees monitoring and evaluation of the system but implementation and how funds used is delegated to provinces.

South African's are making substantial investments in pursuit of these higher-quality schools (De Kadt et al., 2014; Hunter, 2015). Attending these high-functioning, fee-charging schools has significant implications for accessing higher levels of learning as discussed below, as well as acquiring symbolic (especially English language development) and social capital (Hunter, 2015).

A body of evidence is growing on how accessing a quality school, particularly in the primary phase, matters for life trajectories and labour market equalities in South Africa. Studies by Shepherd (2017), Von Fintel (2015), Von Fintel and Van der Berg (2017) and Kotze (2017) using different sets of nationally representative data, identify school quality effects equivalent to about one additional year of learning even after controlling for various selection issues that may drive this result. Von Fintel (2015), for example, using National School Effectiveness Study (2007-2009) data finds that black students who attended former white schools were ahead of their peers in non-white schools by almost a year but school quality effects are greater in lower grades. More recent research based on tracking children across schools in the Western Cape finds similarly large effects of attending a better performing school (Von Fintel and Van Der Berg, 2017). But school quality doesn't just matter for success on tests, school completion rates and university acceptance. Higher levels of skills obtained through access to better quality schools are important for social mobility and are rewarded in the labour market (Burger and Teal, 2016; Moses et al., 2017; Zoch, 2016).

There are, however, severe limitations to the extent to which the functioning, fee-charging school sector can absorb poorer students. On the supply-side there are too few of these schools, and enrolment intake is very small relative to the size of the no-fee sector. At the grade 1 level (the first year of formal schooling) about 70% of students are attending no-fee schools (Van der Berg, 2015, p. 35), typically under-resourced and characterized by histories of dysfunction - a complexity of institutional Apartheid design and resulting political contestation in these school environments (Fiske and Ladd, 2004). On the demand-side, affordability of fee-charging schools (in the public system these schools are also classified as Quintile 4 and 5 schools) is a major constraint due to a combination of direct school fees and at times even higher indirect costs, especially transport given extensive geographical distances between poorer communities to wealthier suburbs with better schools.

With a limited number of schools in the wealthy functional school system and an underdeveloped private sector, addressing the service delivery challenge in basic education must involve the development of quality schools *within* the majority no-fee public education system. These schools are synonymous with the Department of Education's Quintile 1-3 classification (which receive higher per child allocations than fee-charging Quintile 4 and 5 schools but are technically not allowed to charge fees).[4]

One possible lever for improving service delivery in this system is studying poorer schools that are working and transferring systems, procedures, or pedagogical approaches from these functional poor schools to others. This could present a more viable transfer process of best practice than attempting to emulate success from contextually removed former Model-C school environments which face different incentives, are resourced differently, and cater to a much wealthier student composition. But this proposition is premised on an *a priori* assumption that quality or 'outlier' no-fee schools exist. As Klitgaard and Hall (1975) reflect, and apt for the South African context as well, we expect that effective schools exist because "parents and children, administrators and teachers, journalists and

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[4] The official DBE Quintile classification system does not work out as equal quintiles. These Quintiles were originally constructed using Census information on the infrastructural development of the surrounding area to inform student funding allocations in a pro-poor manner. Overtime fee-charging schools in higher Quintiles schools have applied for no-fee status resulting in an over-representation of Quintile 1-3 schools (i.e. they comprise more than 60% of all schools).

taxpayers seem to *act* as if some schools were unusually effective". But our *a priori* assumption that these exceptional township and rural schools exist, supporting the DFID/ESRC study, was based on more than anecdotal behaviour. The following realities supported our assumptions:

- The increased success of black South African students in the National Senior Certificate[5] (matriculation examination) where a strong link between early grade and later grade performance implies that this success was established through access to a functional primary school environment.
- Acknowledged existence of outlier township and rural *secondary* schools as evidenced in National Senior Certificate results and popularised in research such as Christie et al's (2007) "Schools that Work", a more recent update of such institutions (Department of Basic Education (DBE), 2017) and anecdotal media coverage of schools or students that beat the odds.
- Case studies that have highlighted the higher levels of functionality of certain poorer schools over others (Hoadley and Galant, 2015; Levy and Shumane, 2016).
- Some evidence on national improvements in the South African schooling system (albeit off a very low base) as measured in international tests of numeracy from 2003-2015. These improvements were not just limited to wealthier student groups (Department of Basic Education (DBE), 2016b; Reddy et al., 2016, 2015).

But possibly the dominant motivator for this *a priori* assumption is that studies highlight the existence of a 'second pattern' of school choice in South Africa, involving choice between more township schools but less travel or financial investment than decisions to access high-quality, fee-charging schools (De Kadt et al., 2014). In a study of children's daily travel to school in Soweto (a township in Johannesburg), de Kadt *et al* (2014) identify that *only* 15% of primary school-goers in their Birth to 20 cohort sample attend their nearest school (on average about 400m from their home). They posit that

> *"even those families who do not have the resources to travel long distances and pay high school fees still engage in school choice in a more local context, and appear to use this as a tool to improve the educational opportunities available to their children. This stands in sharp contrast to findings from other contexts that less-advantaged parents are often less engaged in school choice, raising additional questions about the implications of school choice for equality of access to educational opportunities." (De Kadt et al., 2014, p. 184)*

However, empirical evidence is necessary to verify whether these school choice patterns do in fact lead to improved access to quality education. There is no guarantee that successful schools may be found. For example, in a survey of 351 schools in Guinea Bissau, West Africa, not one of the sample schools had reasonable levels of literacy and numeracy for age (Boone, 2013).

One's best chance of finding high-performing, no-fee schools is using system-wide rather than sample-based testing data to ensure no outliers are missed in a random sampling process. Unlike many African states which have a primary school leaving certificate[6], South Africa neither has this nor any other consistent metric for measuring learning outcomes across *all* primary schools. However, the introduction of the short-lived Universal Annual National Assessments (U-ANA)– a universal testing system for grades 1-6 and grade 9 implemented between 2011-2014 - provided important data with

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[5] The NSC also known as 'matric' is a school leaving examination at grade 12.
[6] Of all 14 Southern and East African countries participating in SACMEQ testing, South Africa is the only system without a national primary school level examination or testing system in place. ANA was a move in the right direction but was discontinued due to union resistance.

which to better understand the performance of the primary schooling system.[7] Kotze (2017) drawing on U-ANA for 2012-2014, investigates the prevalence and performance of poor schools which manage to perform above a demographic expectation. She notes that only 5% of all Quintile 1–3 schools (no-fee schools), serving only 4% of the learner population, manage to perform at this level. Despite less advantaged citizens engaging in school choice decisions, the extremely low prevalence of quality no-fee schools presents a major barrier to social mobility for most South African families.

Kotze's quantification established a very useful foundation to proceed in identifying how many exceptional no-fee primary schools exist. However, more grass-roots level research is necessary to verify the quality of the schools identified among her '5%' and add supportive evidence to her sobering findings. The notion of deserts of access to quality education is a hard pill to swallow for public and policy-makers, but there has also been widespread concern about the validity and reliability of the ANAs as a testing system, with numerous accounts of cheating through leakage of scripts, teaching to the test, and inconsistencies across school-level results and those in national datasets (Ross, 2016; Taylor and Draper, 2014). One of the primary points of inefficiency is that teachers within schools mark these tests. Given these concerns, Kotze's estimates of adequate schools are likely to be *overestimated* and it also presents some uncertainty about the validity of results. The school search process described in this paper attempts to address some of these validity concerns through supplementing U-ANA with word-of-mouth recommendations.

III.   Method and Data

a)   About the ESRC/DFID funded project

"Understanding resilience and exceptionalism in high-functioning township and rural primary schools in South Africa", more affectionately known as "Leadership for literacy", is an education research project lead by a multi-disciplinary team of researchers across Stellenbosch University, UCT, JET, UNISA and the Department of Basic Education in South Africa. The project was initiated in reaction to a deficit discourse where much research has focussed on the real realities of a highly underperforming schooling system in South Africa. Where solutions are desperately needed in the no-fee sector, less consideration has been given to exploring pockets of excellence that may exist. The project aims to learn from higher functioning primary schools in challenging contexts, particularly in terms of how the organisation is led and managed. The project was premised on the assumptions that these schools exist, where reasons for this *a priori* assumption are presented earlier.

In South Africa schools are administered under nine provincial departments with their own set of characteristics and unique bureaucratic and political dynamics. We located the study within three departments of distinct administrative functionality: Gauteng (a highly functional administration), KwaZulu-Natal (medium functionality) and Limpopo (low functionality).

At project onset, a mixed methods approach with a matched pairs design was envisaged. Each outlier school is paired with a nearby typical or underperforming school. The matched pairs approach assumes that given a similar geographical position each school should share similar socioeconomic characteristics and cultural/political/local dynamics. This largely supports the qualitative component of the project (not reported on here). By making comparisons across high-performing and low-performing schools one can factor out the influence of some unobserved characteristic on the

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[7] In 2015, the ANA's were boycotted by teachers' unions. They have been indefinitely discontinued in the face of union resistance and methodological criticisms. It is not clear that a universal ANA will be implemented again although a sample based ANA-like system could be introduced.

findings. However, the first challenge in establishing a set of schools to visit was to *identify* the outlier school pairs.

b) Method of establishing for potential pool of 'outlier' schools in three provinces

The decision process used in establishing a sample of potential outlier township and rural schools across our three provinces is shown in Figure 1. The process starts with using U-ANA data, collecting our own dataset on school recommendations and then a decision process determining whether potential schools meet the language and grade configuration dimensions of the project.

Figure 1: Mapping out the process used in establishing our final sample of schools to visit
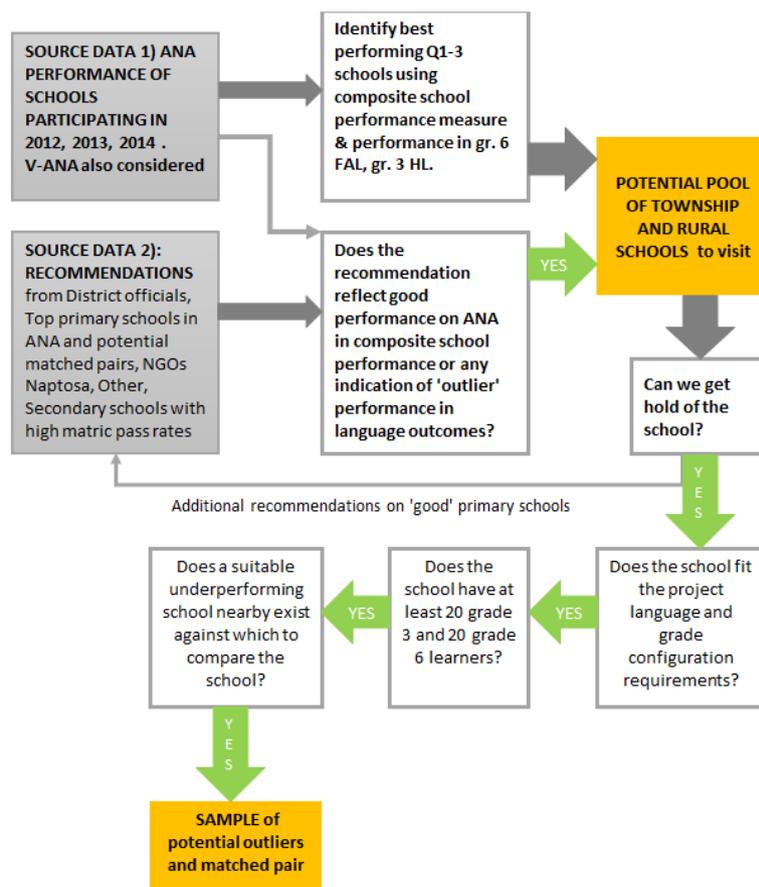
Data source 1, Annual National Assessment data:

The cornerstone of our school identification process was a three-year school level dataset constructed by Kotze (2017) using U-ANA data (2012, 2013 and 2014). Additionally, we looked for best performing Quintile 1-3 schools in the sample-based verification ANA dataset. It is important to point out, that it is often the case that schools do not perform consistently well across all grades, subjects, and years. This is observed in Table 1 showing lower correlations across different performance measures in Quintile 1-3 schools compared to Quintile 5 schools. It suggests that excellence in poorer schools may be better described as existing in pockets (attached to certain teachers, leaders or cohorts of students) than institution-wide.[8] To limit the complication this presents, we focused largely on composite measures of school performance (average performance across grades, subjects, and testing years) as

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[8] It may also reflect more inconsistency in quintile 1-3 schools than quintile 5 schools with respect to marking of tests.

well as performance in testing areas of interest for baseline fieldwork, namely grade 3 home language and grade 6 first additional language.

Table 1: Correlations in performance for Quintile 1-3 and Quintile 5 schools, U-ANA.

		Variable 1	Variable 2	Quintile 1-3 (no-fee)		Quintile 5	
				Correlation coefficient	N schools	Correlation coefficient	N schools
Across year		Composite perf. 2012	Composite perf. 2014	0.53	14 034	0.60	1 343
		Gr 3 Home language 2012	Gr 3 Home language 2014	0.38	11 990	0.46	1 254
		Gr 6 Mathematics 2012	Gr 6 Mathematics 2014	0.42	11 792	0.62	1 201
Across grade		Gr 6 Mathematics 2014	Gr 3 Mathematics 2014	0.53	12 274	0.84	1 253
		Gr 3 Home language 2014	Gr 2 Home language 2014	0.49	12 692	0.73	1 252
Across subject		Gr 3 Mathematics 2014	Gr 3 Home language 2014	0.85	13 195	0.95	1 301
		Gr 5 Mathematics 2014	Gr 5 Home language 2014	0.54	2 446	0.85	1 175

Source: U-ANA, 2012-2014.

In defining better performing schools in ANA we loosely set our benchmark as the average performance of South Africa's Quintile 5 schools (public schools receiving the least allocation per child but charging the highest fees and typically achieving best results on average). The rationale for using this benchmark is that students in Quintile 5 schools typically perform at around the low international benchmark in international tests of numeracy and literacy such as the Trends in International Mathematics and Science Study and Progress in International Literacy Reading Study (Van der Berg, 2015).[9] Using a composite school performance ANA measure (standardised to have a mean of 0 across all ANA participating schools) Quintile 5 schools are on average scoring 1 standard deviation above the national average.[10]

Unfortunately, we had to loosely apply this 1 standard deviation benchmark, simply because so few schools are performing at or above this level. Even with the possibilities of cheating, teaching to the test and other irregularities, only 3% of all Quintile 1-3 schools are performing at or above the average of Quintile 5 schools as seen in Table 2. Using this ANA metric, in Gauteng there are at most 26 no-fee schools with enrolment of at least 250 students performing at this level that we could consider, 85 in KwaZulu-Natal and 11 in Limpopo.

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[9] This is consistent with Kotze's (2017) approach, but ours is slightly more conservative as we benchmark *at* the average rather than within a standard deviation about the average.

[10] Criticism has been levelled from some observers that the choice of our benchmark is too ambitious for the developing context. We argue that this is a conservative benchmark for "good" school performance. We start from a position of equality where all children are assumed to have the potential to achieve excellently, regardless of race or socio-economic status. Our project research team identified specific Quintile 5 schools that we would personally be comfortable sending our children to given our knowledge of schools we have attended, our friends' children attend and have known to be historically great schools. With respect to ANA performance, these institutions are performing around 2 standard deviations above the national mean (not 1 standard deviation) in the composite performance measure. Anything lower than the Quintile 5 average benchmark of 1 standard deviation would constitute inadequate quality.

Table 2: The number of no-fee schools performing at or above the average of fee-charging Quintile 5 schools, U-ANA 2012-2014.

Province	Q1-3 schools performing at or above Q5 average School size >=250		Q1-3 schools performing at or above Q5 average School size < 250		Q1-3 schools performing below Q5 average on composite school performance
	Number	% of Q1-3 schools in sample	Number	% of Q1-3 schools in sample	
EC	15	0.4%	74	1.8%	4 081
FS	5	0.7%	39	5.7%	642
GT	26	3.7%	2	0.3%	702
KZ	85	2.6%	122	3.6%	3 164
LP	11	0.5%	15	0.6%	2 310
MP	1	0.1%	4	0.4%	933
NC	6	2.3%	6	2.2%	255
NW	1	0.1%	1	0.1%	927
WC	0	0.0%	11	2.0%	538
Total	**150**	**1.1%**	**274**	**2.0%**	**13 552**

Source: U-ANA, panel of 2012-2014 data. **Notes:** Averages are calculated using a composite measure of performance across grades1-6, all subjects and three years of data. "Q" is an abbreviation for Quintile. Quintile 1-3 schools are no-fee schools while Quintile 4, and 5 schools are typically fee-charging schools receiving lower per child allocations from the state but charging fees.

While there are few no-fee schools performing at or above the Quintile 5 school average, there is still considerable variation in school performance within the no-fee school sector. Figure 2 shows the gap between the 10th and 90th percentile on the composite performance measure for Quintile 1-3 (no-fee) and Quintile 5 schools. Levels of composite school performance at the 10th and 90th percentile are evidently much higher in Quintile 5 schools but the gap of 1.5 standard deviations between no-fee school performance at the 10th and 90th percentile is not much smaller than the gap of 1.7 standard deviations for Quintile 5 schools. A similar picture is observed for the three provinces in question. This suggests a continuum of functionality even if little to no high-performing schools exist.

There are also considerable numbers of students from no-fee schools achieving above Quintile 5 averages despite poor average school performance. For example, 50% of 157 000 grade 6 learners who achieve above the Quintile 5 average in the 2014 U-ANA mathematics test are from no-fee schools as seen in the first column of figure 3. [11] Of course, there are efficiency concerns. Most learners writing grade 6 mathematics at 73% (of a total of 750, 000) are in no-fee schools as seen in the second column of Figure 3. If the quality of learning (and propensity to cheat) was equally distributed across all school Quintile classifications, distributions in the first and second column would be equal (i.e. 73% rather than 50% of students from no-fee schools should achieve above the quintile 5 average). This is evidently not the case with disproportionately better performance in Quintile 5 schools.

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[11] Using the ANAs, making clear comparisons about English language proficiencies across no-fee and fee-charging schools is not feasible due to differences in the language of learning and teaching in these schools and therefore the tests written, but grade 6 mathematics results are instructive for these purposes.

Figure 2: Standard deviation differences in composite school performance measures across schools at the 10th and 90th percentile, Annual National Assessments
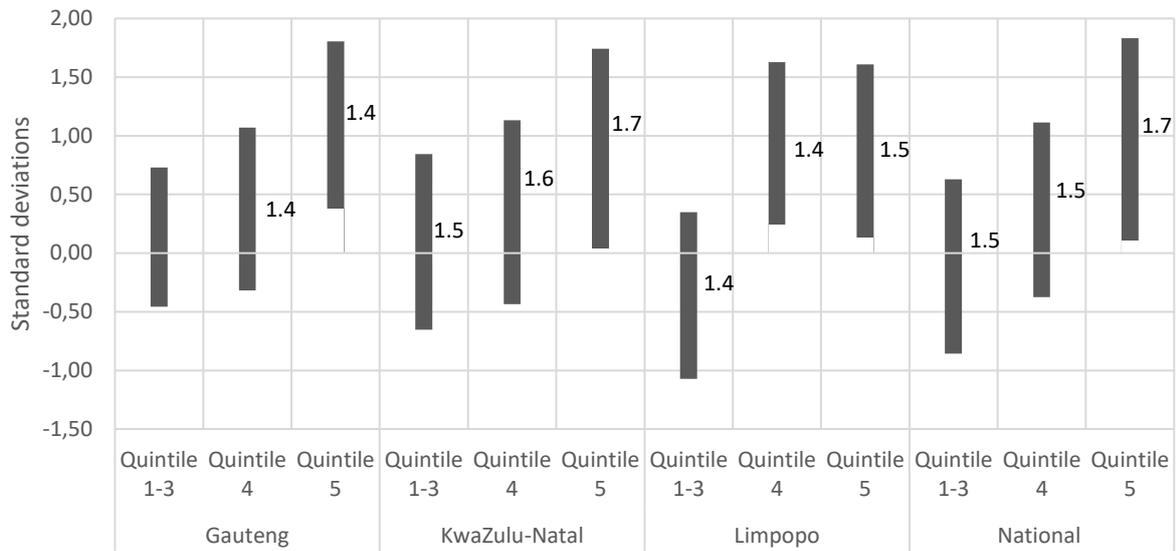
Source: ANA 2012-2014. *Notes:* Composite performance is a z-score derived from average school performance across grades, subjects, and years. The bottom of each bar shows 10th percentile school performance, the top of the bar is the 90th percentile performance.

Figure 3: Grade 6 learners writing mathematics and performance above the Quintile 5 average
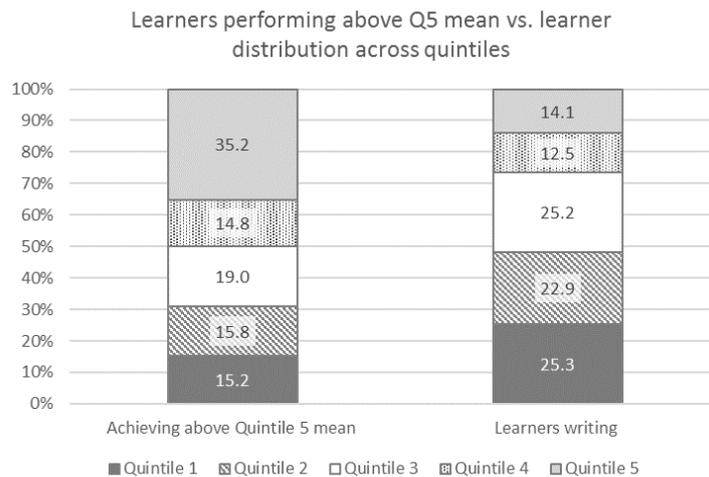
Source: 2014 U-ANA

Data source 2, recommendations of township and rural school:

Given concerns about the reliability of ANA, we also initiated a process of collecting a dataset on school recommendations eliciting stakeholder opinions on "good" township and rural schools with respect to academic performance, particularly in language. We identified individuals and organisations that we assumed would be more aware about school performance including provincial education offices, district officials (specifically subject advisors), non-profit organisations working in the education sector, no-fee secondary schools with high matriculation pass rates, and national and provincial

branches of a teachers' union. We also asked a large education blog readership to identify what they believe are good no-fee schools. Importantly, school recommendations from principals or administrative clerks from no-fee primary schools also comprised a large portion of our responses. This was a direct result of contacting well-performing ANA schools (and potential matched pairs) to scope out the possibility of i) being able to contact them (given terribly outdated EMIS data on school telephone numbers), determining whether their language of learning and teaching in the foundation phase matched our project needs and ii) whether they would be willing for us to visit their school.

Over the period July 2016 to January 2017, we collected 519 recommendations of township and rural schools across Gauteng, Limpopo, and KwaZulu-Natal.[12] 486 of these recommendations coming from about 245 unique sources could be matched to the three-year school level ANA dataset. A breakdown of the numbers of recommendations received per province, with a broad category for respondent type are provided in Table 3. About 83 recommendations were for fee-charging schools (typically with low fees of less than R2000 a year) which do exist in township and rural areas. This recommendations data source aids in the identification of a potential pool of township and rural schools.

Table 3: Breakdown of school recommendations received by recommending institutions or individuals

	Gauteng		KwaZulu-Natal		Limpopo		All recommended schools	
	Q1-3	Q4-5	Q1-3	Q4-5	Q1-3	Q4-5	Q1-3	Q4-5
District official suggestions	25		55	23	50	1	130	24
Q1-3 Secondary schools with high matric pass rates	37	5	25	20	15		77	25
Lower performing ANA primary schools	45	9	14	5	14		73	14
Better performing ANA primary schools	31	4	14	3	5		50	7
NGO respondent	16	2	14	1	16		46	3
Other	8	2	15	8	2		25	10
Total	**162**	**22**	**137**	**60**	**102**	**1**	**401**	**83**
Combined totals	**184**		**197**		**103**		**484**	

Notes: Better performing ANA primary schools are defined here as performing at 0.5 standard deviations or more above the national mean while lower performing ANA primary schools are performing below 0.5 standard deviations on a composite measure of school performance. "Q" is an abbreviation for Quintile.

A descriptive analysis of the U-ANA performance of the recommended schools indicates that they are performing slightly better than schools that were not mentioned. Where respondent's awareness of school performance may vary depending on the subject, grade, or year in question, multiple performance measures are considered in Table 4.[13] Recommended Quintile 1-3 schools are performing better than non-mentioned schools in 9 of 12 different performance measures. They are 10-19% of a standard deviation better than schools not mentioned by any respondent across the

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[12] While we collected a few hundred recommendations obtaining these involved *thousands* of phone calls. Telephone numbers of officials or schools as per national school lists (EMIS) or even obtained directly from districts often do not exist, just ring, or go to voicemail resulting in low ratios of recommendations to phone-calls made. This is a major barrier to fieldwork projects in schooling more generally.

[13] For example, it may be easier to determine how well a school is doing on language than mathematics if performance is deduced informally through conversations with students. But schools may perform better in certain subjects, grades, or years (evident in ANA patterns) - the result of teacher quality differences, compositional differences in student bodies or changes in other school factors.

composite z-score measures. But in absolute terms the performance of recommended schools is still on average very low at 0.04 standard deviations in the first school composite measure (compared with 0 standard deviation average for all schools); and far from our 1 standard deviation benchmark for 'good' performance. Considering the 2014 grade 6 first additional language (FAL) results, Quintile 1-3 schools that were *not* mentioned achieved an average of 41%. In recommended schools, this average was slightly higher at 45% but also considerably far off from Quintile 5 average performance at 60%.

Section V applies a multivariate approach to consider how much better recommended schools are than non-mentioned schools after accounting for observed differences in resourcing across schools. It also explores which system actors were better able to detect better performance.

a) Method of narrowing down the potential pool of 'outlier' schools to verify performance

Having established a potential pool of outlier schools, the next step was to narrow it down to the actual schools in which we could conduct fieldwork to verify performance. The filtering process was largely operationalized by corroborating information on the recommendations received with performance on ANA. However, it was further complicated by language and grade configuration requirements for language testing, national schools' data inaccuracies as well as the matched pair design of the project. These challenges are described in more detail in the appendix. Attention is drawn here to the language dimensions and matched pair design of the project that placed the greatest squeeze on our potential sample.

At project initiation, our plan was to use 2015, 2016 and 2017 universal ANA results in mathematics and language. However, union resistance in late 2014 indefinitely disrupted the continuation of ANA. In response to this setback and to growing concerns about abysmally low levels of basic literacy skills being acquired in both African languages and English across primary schools (Spaull et al., 2016) a decision was taken to focus on just testing *literacy* outcomes at two critical grade transition points: grade 3 and grade 6.[14] We developed reading tests at the grade 3 level in 3 of the 11 official South African languages. The predominance of isiZulu in KwaZulu-Natal and its proliferation in many other parts of the country, including Gauteng, made this an obvious test language of choice. Anticipating a shortage of acceptable schools in Limpopo with its lower levels of learning at the primary school level relative to other provinces, we expanded the language of testing to two areas: Sepedi and Xitsonga.[15]

Initially we wanted to limit our sample to only schools teaching in African home language in the foundation phase (grades 1-3). But the options became so limited that we had no choice but to lift this criterion and include a few English schools in our sample, provided the dominant home language of the class matched our African language testing area in grade 3.

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[14] South African basic education at the primary level is split into three phases; the foundation phase (grades 1-3), the intermediate phase (grades 4-6) and senior phase (grade 7). Students typically learn in their home language in grades 1 to 3, then a language switch to English takes place in grade 4. The curriculum assumes that children have acquired basic reading skills in both their home language and English by grade 3. Testing both African language and English proficiency at this point is an important indicator of the readiness of the child to proceed to further grades and keep pace with the demands of the national curriculum.

[15] It is important to qualify that despite testing in the most frequently occurring languages in these provinces, it became evident after further investigation that best performing Quintile 1-3 schools in ANA in each province are not dominated by a language group. In this respect, we have potentially missed some quality township and rural schools across the three provinces in consideration, in addition to 6 other provinces which were not considered.

Table 4: Average performance of Quintile 1-3 schools that are recommended, not mentioned by respondents and Quintile 5 schools.

Average performance of ANA schools in Gauteng, Limpopo, and KwaZulu-Natal

| | Quintile 1-3 schools | | | | | | | | | | | All Quintile 5 schools | | | | |
| | Schools not mentioned by any respondent | | | | | Recommended schools | | | | | | | | | | |
	Mean	Std. dev.	N	P90	P95	Mean	Std. dev.	N	P90	P95	diff in mean	Mean	Std. dev.	N	P90	P95
Ave. school perf. (z score)	-0.09	0.60	6094	0.72	0.94	0.04	0.59	401	0.82	1.04	0.13**	1.00	0.61	728	1.78	1.90
Ave. school perf. 2012 (z score)	-0.14	0.69	6094	0.79	1.08	-0.03	0.64	401	0.83	1.06	0.11**	1.02	0.68	728	1.88	2.06
Ave. school perf. 2013 (z score)	-0.05	0.69	6094	0.84	1.11	0.04	0.67	401	0.83	1.07	0.10*	1.01	0.64	728	1.81	1.94
Ave. school perf. 2014 (z score)	-0.07	0.70	6091	0.82	1.06	0.12	0.68	401	1.00	1.20	0.19**	0.94	0.74	728	1.76	1.87
Home Language Gr. 3 2012 (%)	52.32	13.41	5286	69.51	74.00	52.53	11.90	357	68.84	72.00	0.21	61.79	11.39	677	75.82	78.29
Home Language Gr. 3 2014 (%)	55.46	14.45	5733	72.88	77.39	56.94	13.10	385	71.85	76.51	1.48*	67.24	13.79	707	82.19	85.00
FAL Gr.6 2012 (%)	34.64	12.29	4375	51.55	57.21	39.62	12.12	276	54.76	59.31	4.98**	62.05	14.34	142	79.60	83.22
FAL Gr.6 2014 (%)	40.97	12.36	5305	56.72	61.36	45.38	13.12	320	60.93	67.28	4.41**	59.68	14.51	106	76.40	78.02
Math Gr 3. 2012 (%)	40.05	15.16	5360	60.00	66.73	41.11	14.57	367	61.88	67.69	1.06	53.19	13.44	676	69.85	74.11
Math Gr.3 2014 (%)	53.58	15.01	5758	72.17	78.06	54.65	13.22	385	70.74	75.38	1.07	67.93	12.79	708	81.63	84.12
Math Gr 6. 2012 (%)	25.53	12.24	5044	43.22	49.45	26.68	11.39	352	43.35	48.26	1.15*	40.20	12.50	632	57.03	59.97
Math Gr 6. 2014 (%)	39.26	13.73	5571	57.47	62.37	42.28	13.02	366	60.55	62.70	3.02**	58.74	13.50	702	74.43	77.23

Notes: FAL stands for First Additional Language. Performance over time is not directly comparable in ANA. * means are significantly different at the 90% level, **means are significantly different at the 95% level. A difference in means test is used to compare the average academic performance of quintile 1-3 schools in Gauteng, KwaZulu-Natal and Limpopo that were not mentioned by respondents (first column of Table 4) against those that were recommended (second column). The first 4 of 12 are composite ANA averages across grades 1-6 and all subjects expressed as z-scores but differing by year of testing. The rest are subject specific measures, expressed in percentage terms, for home language (HL), first additional language (FAL) and mathematics for years 2012 and 2014, focusing on grades 3 and 6.

Table 5 summarises our reasons for selecting the final 31 schools as potential 'outliers' other than the fact that they all meet language and grade configuration requirements of the project. It shows if schools are performing at or above the 1 standard deviation benchmark, the 90th percentile (0.63 standard deviations) in the national distribution of all Quintile 1-3 schools participating in ANAs as well as 90th percentile in grade 3 home language and 90th percentile in grade 6 first additional language. It also identifies if and how many respondents recommended each school. Three important points are noted from the table:

- In Gauteng and KwaZulu-Natal our final selected 'good' pairs were typically recommended at least once from a word-of-mouth source. Some of these schools were performing below the 1 standard deviation benchmark but typically were performing at or above the 90th percentile in at least one of the ANA measures considered. In the exceptions where a word-of-mouth recommendation had not been received for the school, but we included it in the sample anyway, this was because it really appeared to be an outlier in terms of the composite school performance measure in ANA. (There is 1 school in KZN which we included despite its average ANA performance because as many as 5 different word-of-mouth sources indicated this was a good school – the maximum number of recommendations we had received for any school).
- In Limpopo, the selection criteria had to differ. For only 3 of the 10 potential outlier schools selected did we receive a word-of-mouth recommendation. Despite collecting roughly 100 suggestions for primary schools to visit, there were so few cases where recommendations aligned with good performance on ANA and project language dimensions– in most cases recommended schools had dismally low ANA performance in the national context although they may be better performing relatively within the province. This is observed in Figure 2 where the performance of Limpopo's Quintile 1-3 schools at the 10th and 90th performance is considerably lower than in Gauteng and KwaZulu-Natal. (Details corresponding to figure 2 are provided in the appendix A-Table 2).
- Not all the final schools selected were no-fee schools. With few potential no-fee outliers emerging we included five *low* fee-charging public schools (under R2800 per annum) in the sample.

The matched pairs were chosen based on being the closest school to the outlier that i) had the same language of learning and teaching and ii) was underperforming relative to the outlier in the pair on key U-ANA metrics. Due to these criteria, the matched pair school was not always the nearest school. Furthermore, only schools with at least 20 learners enrolled in grade 3 and 20 in grade 6 were included.

a) Fieldwork: Verifying school performance

We visited and assessed students in 61 schools in 3 provinces of which 31 were potential high performing schools.[16] Quantitative fieldwork was conducted for one day in each school between early February into the beginning of March 2017. National and provincial education department approval was obtained for the study as well as ethical clearance from Stellenbosch University.

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[16] Due to school access challenges during fieldwork we surveyed only 29 pairs rather than 30 as initially intended (10 in Gauteng, 10 in KwaZulu-Natal, 9 in Limpopo). One Limpopo school which seemed to be high performing in ANA was visited but due to bad weather and strike action we could not access its intended underperforming pair. Instead we visited 2 additional schools for which we received recommendations, bringing the total sample to 61.

Table 5: Reasons for selection of potential "outlier" schools

	Low-fee-charging	# of 'word of mouth' recommendations	Composite performance 3 year (z-score) 1 std	Composite performance 3 year (z-score) 90th pct.	Gr 3 home language 2014, 90th pct.	Gr 6 home language 2014, 90th pct.	Gr 4 first additional language 2014, 90th pct.	Gr 5 first additional language 2014, 90th pct.	Gr 6 first additional language 2014, 90th pct.
Gauteng									
GP10		0	X	X			X	X	X
GP6		0	X	X			X	X	X
GP (no pair)		1	X	X	X		X	X	X
GP8		1		X	X		X	X	X
GP9	X	1	X	X	X				X
GP3		1	X	X		X			
GP5		2		X			X	X	X
GP7		2	X	X			X	X	X
GP1		3	X	X			X	X	X
GP2		5		X		X			
KwaZulu-Natal									
KZN20		0	X	X					
KZN14		0	X	X	X		X	X	X
KZN15		1	X	X					
KZN12		1	X	X	X		X		X
KZN13		2							X
KZN (no pair)	X	2		X		X			
KZN18		2	X	X	X			X	X
KZN19		2	X	X			X	X	
KZN11		2	X	X	X		X	X	
KZN17		5							
KZN16	X	5	X	X	X		X	X	X
Limpopo									
LP24		0				X	X	X	X
LP30	X	0				X	X		X
LP28		0		X	X		X		
LP29		0	X	X	X			X	X
LP26		0		X	X				X
LP21	X	0				X		X	X
LP27		0		X			X	X	X
LP22		1	X	X				X	X
LP25		1				X	X	X	X
LP23		3			X		X	X	

Notes: Percentiles (pct.) of performance in ANA are calculated in relation to all (Q1-3) schools that are in the 2012-2014 ANA panel dataset. Composite performance 3 year (z-score) – performance at the 90th percentile for all Quintile 1-3 schools is 0.63 standard deviations.

At the grade 6 level, we administered an English written test to one full class per school visited. A total of 2 652 grade 6 students were tested and background information was collected on each student. I give most attention to these grade 6 outcomes as it involved testing an entire class – a larger sample than for the grade 3s where time constraints of one-on-one Oral Reading Fluency testing limits the potential for larger samples.[17]

The grade 6 test focused on English literacy where permission was received from the IEA to administer two comprehension tests - released items from previous rounds of the 4th grade Progress in International Reading Literacy Study (PIRLS). This allow us to internationally benchmark student proficiencies in our sample to other country samples. An internal word analysis conducted by our research team, indicates the first comprehension text is appropriate for a grade 3 level while the second is appropriate for a grade 5 level. Table 3 in the appendix provides an analysis of the type of literacy skills tested in the two comprehensions as identified by the IEA. The literacy test also considered English vocabulary development, testing most common to less common words in English. Total possible marks obtainable in the entire test was 106.

The following section discusses the test results from February data collection.

IV.   Results: Did we identify any outlier schools?

The performance of our 31 outlier pairs is measured in two ways. First, we juxtapose their performance against literacy outcomes in 11 other middle-income countries participating in PIRLS. Second, we consider their performance relative to each other and the matched pairs. The analysis that follows relies on both descriptive and multivariate methods.

a) Descriptive analysis

The top panels of Figure 4 and 5 juxtapose the performance of students in each of the 31 potential outlier schools (equivalent to 31 different grade 6 classrooms) to students in lower to upper middle-income country samples[18] that wrote the two PIRLS texts described in section III. The figures show performance on each text separately, highlighting the percentage correct across each test at the 50th and 90th percentiles. All countries shown administered these tests at *the grade 4 level*, except for Botswana and Honduras which administered the tests at the grade 6 level. The samples in the figures are sorted by median performance.

Evidently, the overall performance of the 31-school sample does not fare well relative to the comparator countries. Across both texts there are only 2 schools in our sample, LP21 and KZN0 (both low-fee schools), with performance that exceeds the median and 90th percentile performance of the combined comparator countries. But even these two best schools do not stand out as much better than random country samples of students in Romania, Georgia and Croatia that are at a 2-grade level disadvantage. Most sobering is the contrast with students in neighbouring Botswana, as many as 21 of the 31 purposefully selected and recommended grade 6 school classes are performing worse at the 50th percentile in the first text than a random sample of Botswanan grade 6 students (28 of 31 in the second text).

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[17] Additionally, several instruments were administered to capture student and school characteristics, school climate, school functionality indicators, teacher perceptions and leadership and management practices.
[18] Azerbaijan, Botswana, Croatia, Iran, Russian Federation, and Romania are classified as upper middle-income economies along with South Africa. Honduras, Georgia, and Morocco are classified as lower middle-income economics using World Bank classifications.

Figure 4: An international comparison of a) potential outlier and b) matched school pairs on PIRLS text 1 (literacy experience), % correct on entire comprehension
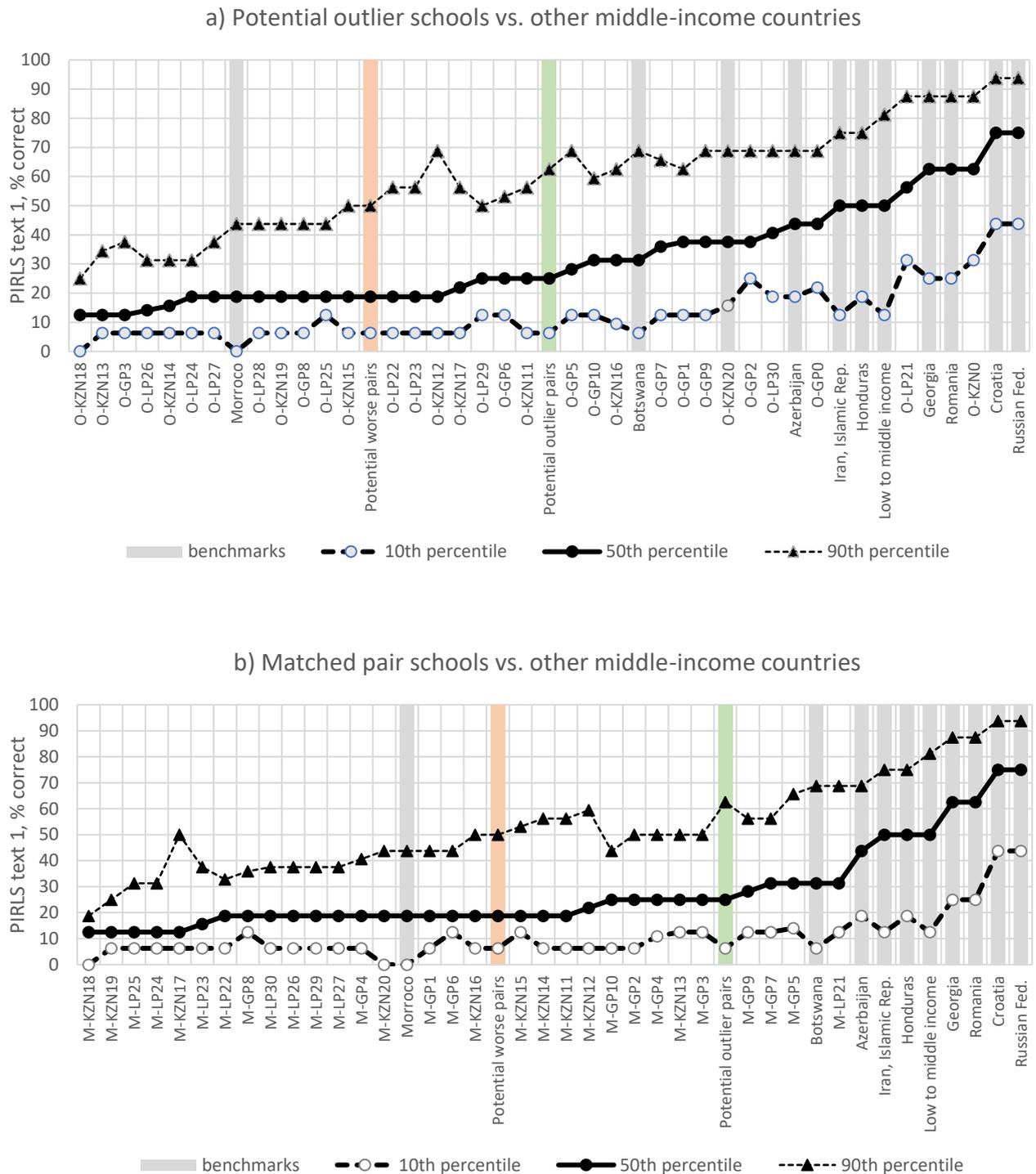
a) Potential outlier schools vs. other middle-income countries

b) Matched pair schools vs. other middle-income countries

Source: *Own collected data, analysis of PIRLS 2011 international database. Except for Honduras and Botswana, all benchmarking countries write the test at the grade 4 level. Each pair is labelled with the same province (KZN, GP, or LP) and school number but potential outliers schools are prefaced with a 'O', and matched pairs with an 'M'.*

Figure 5: An international comparison of a) potential outlier pairs and b) matched pairs on PIRLS text 2 (acquire and use information), % correct on entire comprehension
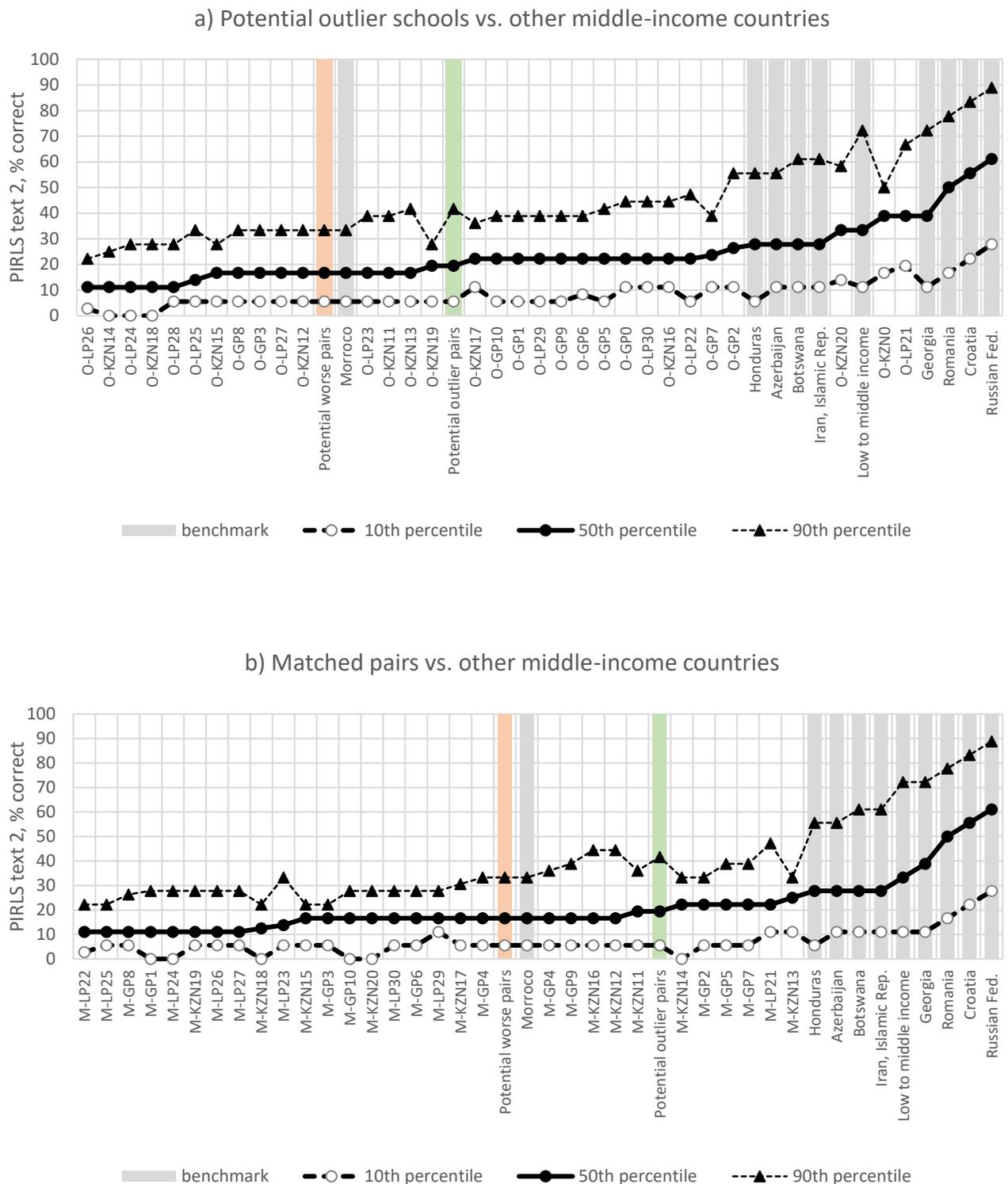
a) Potential outlier schools vs. other middle-income countries

b) Matched pairs vs. other middle-income countries

Source: Own collected data, analysis of PIRLS 2011 international database. Except for Honduras and Botswana, all benchmarking countries write the test at the grade 4 level. Each pair is labelled with the same province code (KZN, GP, or LP) and school number but potential outliers schools are prefaced with a 'O', and matched pairs with an 'M'.

While we may not have found any no-fee schools (in 3 provinces) with unusual performance in English literacy by select middle income country standards, the figures show variation across the school sample. The performance distribution of the outlier pairs typically lies to the right of the matched pair samples, seen in the bottom panels of Figures 4 and 5 which plot matched pair school literacy performance against that of benchmarking countries and the outlier pairs.[19] This is expected due to the outlier and underperforming matched pairs design yet suggests that within geographic locales it is possible to find a slightly more functional no-fee school than another.

Additionally two low-fee-charging schools outperform 29 other potential outlier pairs; and performance at the 90th percentile reflects that even in schools with weak median performance there are outlier students. However, students in these schools may be performing better simply due to their background differences, such as exposure to English, early childhood development, parental involvement, and access to a literacy rich environment. The next section interrogates whether relative performance differences hold even after accounting for differences in student background.

b) 61 school sample residual analysis

This section considers whether there any schools that are statistically unique in the 61-school sample, even after controlling for students' background factors.

Estimation strategy

Following the work of Klitgaard and Hall (1975), I identify more effective schools in our sample using a residual analysis across the entire 61-school sample. Using a standard production function regression framework, I control only for socioeconomic and other non-school background factors and assume that remaining variation could be attributable to the school. Of course, one can't rule out that the remaining variation could also be the result of factors such as measurement errors, omitted variables or other random noise. Nevertheless, if at least some unusual residual performance remains after controlling for background factors then it is possible that there may be some schools in the sample that are having a more positive impact on students. To estimate the residuals, I use the following regression framework where Y reflects the performance of the individual student in school s, measured in total marks on the combined PIRLS texts and a vocabulary test. X is a vector of students' background characteristics but school characteristics are intentionally excluded from the model with effects rather captured in e, the residual.

$$Y_{is} = \beta_1 + \beta_2 X_{is} + e$$

To test the sensitivity of the residuals to the inclusion of controls, I estimate 6 different models which sequentially include more background controls. The most parsimonious model only includes a composite index of student's socio-economic status (SES) derived through a principal components analysis of asset ownership indicators and a square of this index to allow for non-linearity in the relationship between learning outcomes and SES. Model 2 includes controls for whether the student's mother speaks English at home, and whether the student attended grade R or crèche before grade 1. Model 3 then includes indicators for whether the student lives with their mother and father as well as access to literacy materials at home including indicators for number of books and access to own story

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[19] This is confirmed in Appendix Figure 1 showing distributional plots of student performance in outlier versus matched pair schools by province. However contrary to what was reflected in ANA performance data, there are cases where the anticipated outlier pair did not outperform the matched pair. In 39% of pairs the potential outlier school *underperformed* relative to the matched school in median performance on PIRLS text 1. Using the 90th percentile, there is less discrepancy at 25% (see the appendix Table 1)

books. The age and gender of the student, as well as an indicator to capture his or her attitude towards reading are included in model 4. Students were presented with some simple questions to ascertain how they felt about school using emoticons. Our indicator for reading attitude takes on a value of 1 if the student circled a 'very happy' emoticon face when asked "how do you feel about reading?" (reference category includes very unhappy, unhappy, happy). Model 5 adds an index of the wealth for the small place area in which the school is situated and its square derived from the Census 2011[20] as well as an indicator for the rural status of the school which also likely proxies for the rural/urban status of the student's home. Finally, in model 6 a class averaged index of student's asset indices is included.

Results

Moving across each model's results in Table 6 it is evident that an asset index of student SES is not sufficient to account for student background. Although residency with parents and access to literacy material at home does not appear to contribute much to the models, indicators for grade R or crèche attendance and attitude towards reading are significant and positive. Age[21] and gender of the student enter significantly with an advantage to girls evident in the estimations. Rural status is negative but not consistently significant while the small place area in which the school is located (and likely where students live) reflects a strong convex relationship with literacy. Despite the inclusion of a student asset index, the small place area Census index contributes significantly to the explained variation. It is important to note that student residuals in schools with the wealthiest student compositions are most sensitive to the inclusion of additional wealth controls (suggesting that the asset index is not good at capturing enough wealth variation at the top end).

Although Model 6 shows that mean student SES is significant and adds explanatory power to the estimation, I rather use the residuals in model 5 which does not control for school effects through the inclusion of school level variables.

To assess whether students in a school are performing better than expected given their background factors, I plot standardised residuals (e) against unadjusted (standardised) total marks for each school's grade 6 performance, focusing on the 50th and 90th percentile. As shown in Figure 6, English literacy performance in two low fee-charging schools reflected in blue (LP21 and KZN0) continue to exceed the demographic expectations of the sample suggesting particularly positive school effects relative to the sample. At the 90th percentile students in these schools are performing 3-4 standard deviations above sample expectations after accounting for their background characteristics. Promisingly, there is also one no-fee school in KwaZulu-Natal which exhibits unusual performance at the 90th percentile after the background adjustments. Two no-fee schools in Gauteng, GP1 and GP2, also appear to be exceeding sample expectations at the 50th percentile with residual performance on a par with the low-fee-charging Limpopo school (LP21).

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[20] The author is grateful to Chris van Wyk and Asmus Zoch for the construction of this index.

[21] The inclusion of the age of the child is somewhat problematic. While this may be influenced by background factors (e.g. decisions about when to send a child to school), grade for age could be influenced by school factors if poor teaching or assessments contribute to failure. Progression rules however limit the number of times children can fail in a school and therefore school effects are unlikely to strongly drive the presence of overage children.

Table 6: Estimations of grade 6 total marks controlling for student background

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Student SES index	1.833***	1.797***	1.759***	1.714***	1.122***	0.494***
	(16.87)	(16.55)	(15.70)	(15.49)	(8.46)	(3.52)
Student SES index squared	0.164***	0.157***	0.153**	0.167***	0.0877	0.0506
	(3.50)	(3.33)	(3.26)	(3.64)	(1.87)	(1.03)
Mother speaks English		2.190	2.436	2.483	3.173*	1.855
		(1.52)	(1.72)	(1.88)	(2.30)	(1.41)
Mother's language is missing		-6.447***	-5.669***	-4.839***	-4.643***	-4.976***
		(-10.30)	(-8.57)	(-7.40)	(-7.08)	(-7.96)
Attended grade R or crèche		1.302***	1.377***	1.158***	1.123***	0.979**
		(4.05)	(4.27)	(3.64)	(3.61)	(3.12)
Lives with mother			0.585	0.472	-0.0389	-0.0975
			(1.06)	(0.87)	(-0.07)	(-0.19)
Lives with father			-1.463	-0.961	-1.201	-1.063
			(-1.59)	(-1.07)	(-1.37)	(-1.27)
Lives with mother X Lives with father			0.513	0.161	0.559	0.578
			(0.51)	(0.16)	(0.58)	(0.63)
Has a few books (10)			0.874*	0.878*	0.847*	0.397
			(1.99)	(2.04)	(2.04)	(0.97)
Has enough books to fill one shelf (20)			-0.0331	-0.00797	-0.0431	-0.430
			(-0.05)	(-0.01)	(-0.07)	(-0.69)
Has enough books to fill one bookcase (50)			2.405	2.416	2.353	2.495
			(1.63)	(1.69)	(1.66)	(1.79)
Has enough books to fill two or more bookcases (100)			-4.931**	-4.954**	-4.956**	-4.857*
			(-2.74)	(-2.70)	(-2.70)	(-2.16)
Books missing			-2.632***	-2.168***	-2.029***	-2.408***
			(-4.14)	(-3.43)	(-3.33)	(-3.99)
Number of own story books at home			0.0132	0.00197	0.00793	0.00377
			(0.47)	(0.07)	(0.29)	(0.14)
Age				-1.487***	-1.476***	-1.302***
				(-9.13)	(-9.31)	(-8.51)
Is a girl				2.146***	1.982***	1.926***
				(5.80)	(5.42)	(5.36)
Child feels very happy about reading				0.797*	1.000**	1.142**
				(2.19)	(2.82)	(3.28)
Census small area wealth index					-22.30***	-19.19**
					(-3.77)	(-3.04)
Census small area wealth index squared					34.88***	20.60**
					(4.96)	(2.60)
Rural					-1.505*	-0.426
					(-2.44)	(-0.68)
Average class SES						2.598***
						(8.98)
Average class SES squared						0.434***
						(3.55)
Constant	12.53***	11.63***	11.25***	27.16***	30.73***	29.55***
	(55.48)	(34.27)	(19.18)	(12.79)	(12.02)	(11.68)
Observations	2652	2652	2652	2652	2652	2652
Adjusted R-squared	0.114	0.135	0.147	0.190	0.223	0.254

Source: February 2017 data collection, Leadership for Literacy. **Notes:** Statistically significant * p<0.05, **p<0.01, ***p<0.001. Indicators for missing information are also included for mother's language, books at home, lives with mother and lives with father.

Figure 6: Performance of median grade 6 students in the class – adjusted versus unadjusted performance on grade 6 English literacy test
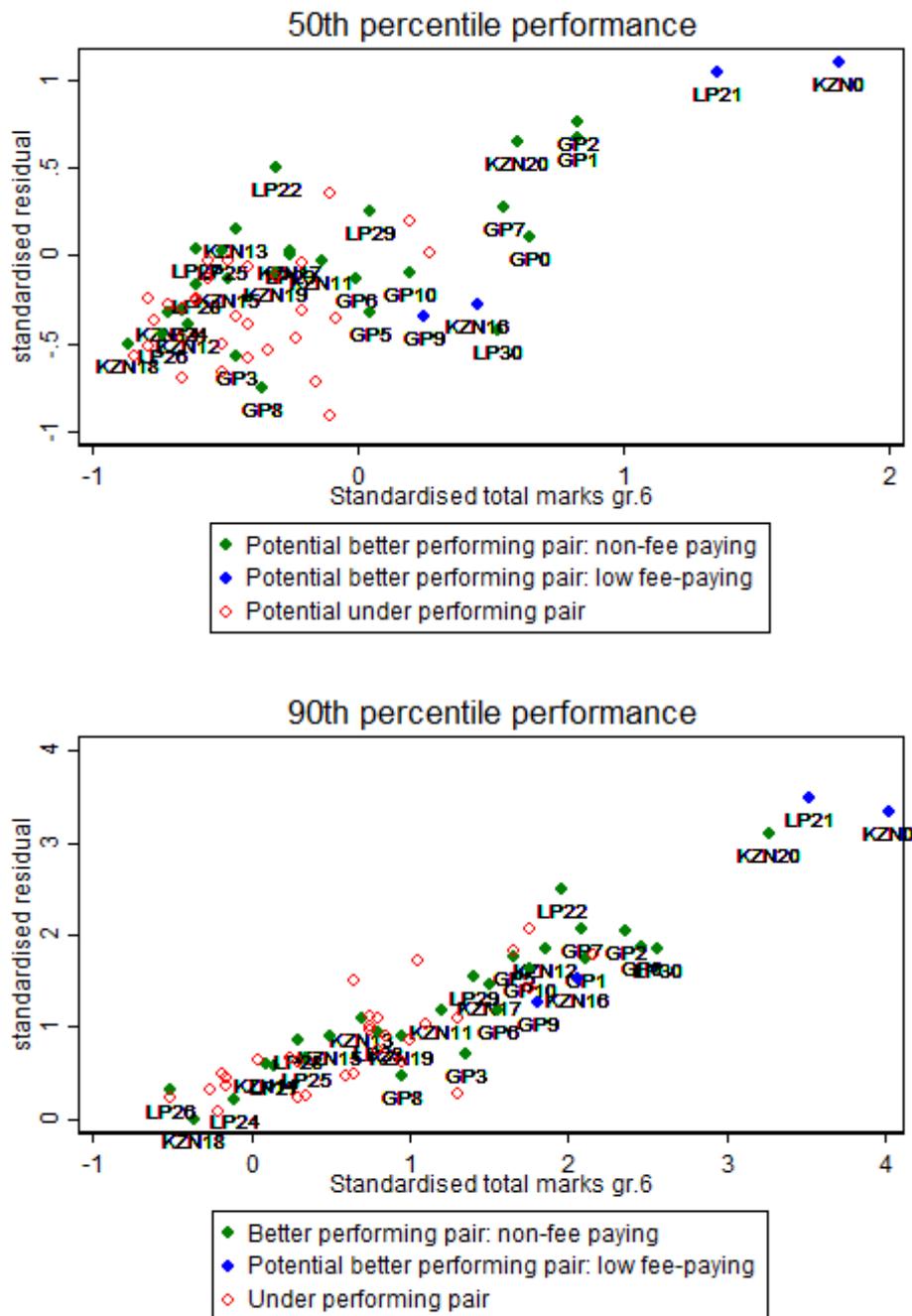
Notes: The standardised residual from a linear regression of total marks on student's background characteristics, model 5. This is the unexplained performance of the median student after accounting for their age and gender, socio-economic status (proxied by an index of asset ownership, small census place area wealth index and rural indicators), residential status with parents (whether child lives with their mother, lives with their father), grade R or crèche attendance and language support at home (mother speaks English at home, anyone reads to the child at home, number of books at home).

There are also some seemingly underperforming schools which are achieving much better results than expected given the relatively poorer backgrounds of their students. Rural school LP22 is such an example. Without adjusting for student background, this school would be labelled as underperforming, potentially targeted with interventions and scrutinised by its district office when in fact it is potentially more efficient than other schools given its student composition. Conversely some schools that may be praised for good performance are actually inefficient as reflect in the residual analysis; for example, low-fee-charging schools GP9 and KZN16 in blue.

In future national attempts to identify underperformance or exceptionalism, whether at the primary or secondary level (especially matric), appropriate adjustments must be made to account for student background differentials. Even in the presence of information on school performance one can make erroneous conclusions about school and teacher efficacy if performance is not juxtaposed against student background realities (which span a continuum within the no-fee school sector).

Another significant finding from the residual analysis is the presence of outlier (or resilient) students regardless of general school effectiveness. Even in very weak schools, there are some students performing at 3 or more standard deviations above sample expectations after adjusting for their background characteristics. This is highlighted in Figure 7 - a boxplot of residuals from model 5 for all 61 schools (but distinguished into outliers and matching pairs). The boxplot of class performance shows the median, 25th and 75th percentiles, but what is of interest here are upper ends of the whiskers and the outlier values indicated by the scatted dots. There are students that appear to exceed expectations despite their home *and* their school environments. This is not just an anomalous feature of our data. A look at PrePIRLS data 2011 reveals that about 5-6% of South African grade 4 children writing African language tests reach high benchmarks in reading (550 points or above). Despite comprising a minority, there are literally one or two high achievers in over half of all classrooms or schools tested in African languages. Future research would do well to better understand the processes and characteristics underlying their higher performance and resilience in the South African context and how the potential of these students can be nurtured. As evidenced in recent case studies observing the teaching of reading and writing in foundation phase classrooms in the North West province, top performers are not being extended enough as teachers fail to differentiate instruction to suit the varied ability level of students in their classrooms (Reeves, 2017, pp. 56–58).

The variation in performance within classrooms is also worth noting in Figure 7. With the range of literacy proficiencies observed in these grade 6 classrooms, they are in effect multi-grade classrooms. For example, in almost 50% of the 61 classrooms the range between the top and bottom learners in each class was over 69 percentage points in the PIRLS easier text. In a system with promotion policies limiting the number of times students can fail within a phase (making grade progression inevitable regardless of meeting curriculum requirements), it is imperative that schools and teachers are provided with the tools to manage the diverse proficiencies of learners in their classrooms, with remedial support for struggling learners.

Figure 7: Box plot of standardized residuals (from model 5, estimation of total grade 6 English literacy test marks) for potential outlier and matched school pairs.
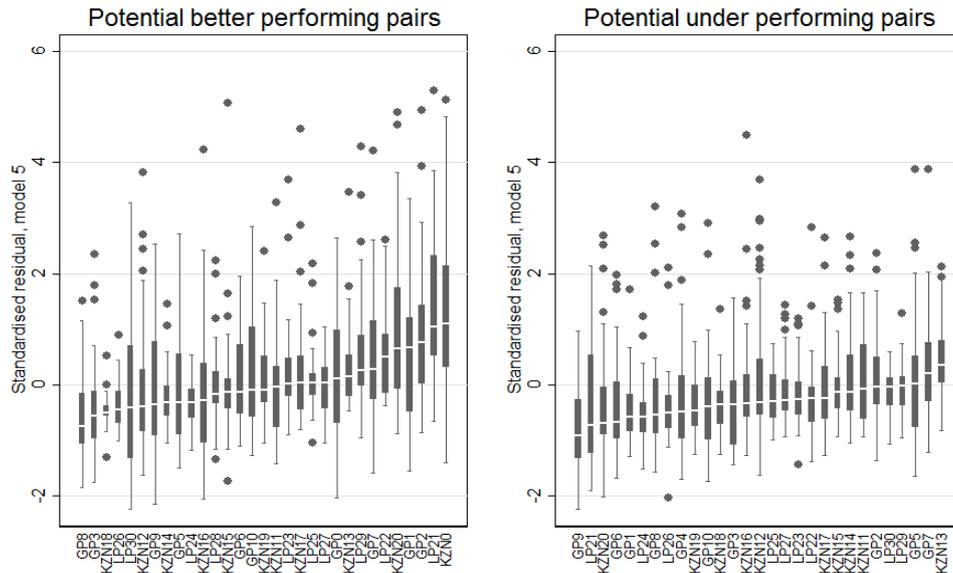
V.   Were respondents able to identify better quality schools?

The descriptive and multivariate analyses of U-ANA data and the tested samples of schools have highlighted that a continuum of functionality exists in the no-fee system, despite the scarcity of best practice schools. But are system actors able to detect the variation in quality that exists across these schools? Lepine (2015) highlights that school performance is not always the main determinant of quality preferences in Brazil, where preferences regarding schools are heterogenous across socio-economic groups (Hastings et al., 2009). For example, distance and school demographics are valued more highly than school performance in countries such as Pakistan and Chile (Carneiro et al., 2013; Schneider et al., 2006) while South African studies suggest that demand for English rather than African medium instruction may be the most critical determinant of school preferences (Hunter, 2015; Msila, 2005). Drawing on data source 2, school recommendations from various system actors linked to U-ANA performance and national schools' data, this section explores further whether respondents could recommend better quality schools.

Estimation strategy
Although recommended schools are achieving slightly higher levels of learning than those not mentioned as shown earlier in the descriptives of Table 4, it is possible that learning outcomes do not directly inform quality perceptions. Respondents perceptions of quality may be a function of other observable characteristics such as language differences, student compositional or resourcing differences that are positively correlated with learning outcomes. Holding these factors constant, are recommended schools still better than non-mentioned schools? This is operationalized by running a multivariate linear regression as reflected in the following framework,

$$Y_s = \beta_1 + \beta_2 D_s + \beta_3 X_s + e$$

where Y_s is one of either 12 measures of performance or 3 enrolment growth measures which are often considered indicators of school functionality. D_s is an indicator that takes on a value of 1 if the school was recommended and 0 otherwise.

I capture resourcing differences across schools, X_s through the following controls:

- Indicators for official DBE quintile status.
- Pupil to teacher ratios.
- A wealth index (and its squared term) for the small place area in which the school is situated as identified from the most recent Census 2011.
- Indicators for the school's languages of learning and teaching. South Africa has 11 official languages. English is set as the reference category.

Respondents may also choose schools based on differences in bureaucratic administrative processes at the provincial and district level that may raise overall school performance. To account for these differences, I include provincial indicators in all estimations. Results are shown in Table 9. District level fixed effects are also used, running estimations separately with results reported in Table 10. Each table shows the estimated coefficient on the indicator of interest, D_s. The independent or outcome performance measure being estimated is defined in the first column of each row.

Multivariate results
The coefficients for each of the estimations in part A of Table 9 confirm earlier descriptive findings that on average respondents can detect slightly better performing schools. Coefficients are positive and significant for 11 of the 12 performance measures and the average difference in favour of recommended schools is only slightly attenuated when controlling for observable school characteristics. (Coefficients in the estimation are not too different from the difference in means calculated earlier in Table 4 despite controls for resourcing differences and provincial administration.) For the first 4 composite school measures, recommended schools are about 8-10% of a standard deviation better than non-mentioned schools. Of course, it is possible that recommendations may be informed by other unobserved characteristics that are positively correlated with learning outcomes such as leadership and management proficiencies. The estimation is limited in this regard.

I also find, but results are not reported here, that average school performance is increasing in the number of times the school was recommended, adding legitimacy to our search strategy for choice schools. The most revealing findings, however, occur when we disaggregate the variable of interest by the type of respondent who made the recommendation. In part B of the table, the single variable of interest D_s is replaced with six indicators,

- R_1 = recommended by a district official,
- R_2 = recommended by a respondent in a good secondary school (high matric pass rate),
- R_3 = recommended by a respondent in a bad to ok performing primary school,
- R_4 = recommended by a respondent in a good primary school,
- R_5 = recommended by an NGO working in education,
- R_6 = recommended by other source

The reference category remains that the school is not mentioned by any respondent. For brevity, Table 7 summarises the number of measures for which significant results are identified across the 6 groups of respondents in Tables 9 and 10. The results are surprising. Of the 6 groups in our sample NGO respondents, the group of 'other' respondents, secondary school respondents and district officials are the *least* effective at identifying better performing schools. Significant positive effects on district official recommendations are only identified in at most 3 of the 12 estimations. Respondents from

primary schools (typically school principals or administrative clerks), especially those from lower performing primary schools in U-ANA were the best at identifying better performing schools. For 11 of 12 performance estimations, schools recommended by respondents in lower performing primary schools are achieving statistically significantly better results than non-mentioned schools. Coefficients sizes of their recommendations are also notable: 30-40% of a standard deviation on composite performance measures (reflected in the estimations with and without district fixed effects) and 7-8% better on grade 6 First Additional Language.

Table 7: Who is best among the set of respondents at identifying better performing schools? Number of measures in which recommended schools perform better than non-mentioned schools, by group of respondents.

	Significant, positive coefficient in X out of 12 school performance estimates		Significant, positive coefficient in X out of 3 school enrolment estimates		N recommend-ations
	Without district FE	**With district FE**	**Without district FE**	**With district FE**	
District officials	1	3	2	3	130
A good secondary school	0	1	1	0	77
Lower performing primary schools	11	11	0	0	73
Better performing primary school	8	8	0	1	50
NGO respondents	0	2	2	2	46
Other	0	0	1	1	25

Notes: Summary of significant results for Table 9 and 10.

This is somewhat puzzling. Why is it that the very group one would least expect to know about school performance provide better recommendations than district officials or NGOs, initially assumed to have more information on schools' performance? This may be a peculiarity of the non-randomness of the respondent sample but this may also reflect informational asymmetries. Different groups may have access to different sources of information on school performance, especially when there has been little systematic approach taken to publicly disseminate available ANA data. For example, respondents from primary schools may be making more informed recommendations because of their geographical proximity to other schools and localised knowledge about neighbouring schools. The median distance between respondents from primary schools and the school they recommended was as little as 1.53 kilometres and the distance at the 90th percentile was less than 9km (see Table 8). The median recommended school was about the 6th nearest school to a respondent's primary school position (see appendix A-Figure 2). It would be instructive to explore further on what basis school quality judgements are being made at these localised levels. This has implications for the design of informational and transparency interventions including the dissemination of any future national testing data such as ANA. As noted by Read and Atinc (2017, p. 12), one can't just impose interventions without a fuller consideration of contextual dynamics and better understanding "*which* local actors use *what* types of information to *what end*…"

Table 8: Distance of a respondent in a school location to the primary school they recommended.

Distance of recommended school from respondent in recommending school (Kilometres)	
P10	0.41
p50	1.53
p75	3.94
p90	8.67
N	**141**

On the one hand, it is surprising that district officials were the least effective at identifying better performing primary schools. On the other hand, this is not unexpected if bureaucratic indicators of success redirect their attention to the wrong metrics. If too much value is placed on school compliance metrics with respect to fulfilling administrative duties as a gauge of school effectiveness, the wrong metrics for quality education service delivery may dominate officials' perceptions of primary schools. Another explanation is that they may have data on school performance within the same school which can be inconsistent across subjects, grades or years in question as shown earlier in Table 1. This would make it difficult to ascertain whether a school is doing well on average. However, district officials are particularly good at recommending schools with higher enrolment growth. Their recommended schools had nearly 7% higher enrolment growth between 2012 and 2014 compared with non-mentioned schools. This is not surprising if district officials are exposed to school enrolment data and the growth needs of schools. The opposite holds for our primary school respondents – they recommend schools with better performance but not higher enrolment.

In summary, this analysis indicates that some system actors can distinguish better performing schools from average performing schools. However, some groups are better than others at detecting quality. For certain groups in our sample, specifically education district officials, enrolment growth appears to be a better indicator of their preferred school than measures of student performance. It casts doubt on the ability of the education administration to detect quality differentials that exist within the no-fee system.

At this point it is useful to mention a key qualitative finding that emerged in collecting the recommendations data on good schools. In response to our question "Can you recommend a good township or rural school?" we were often met with this surprising response: "What do you mean by 'good'?" This was followed with clarifications such as "Do you mean resources, facilities, the principal or academics?" This phrase "what do you mean by good?" highlights a fundamental constraint to developing excellence in South African schooling: inadequate reference frames for "good" schooling from which citizens or even those within the system can assess the quality of a school, compare the quality of one against the other, or establish whether a set of teaching practices are more effective than another. This is not surprising given the scarcity of best practice or even adequate no-fee schools. But inadequate reference frames are also likely attributable to apartheid legacies. Spatial controls, and racially desegregated education environments prevented exposure and sharing across disadvantaged and more privileged school environments. These spatial legacies are also enduring, at least among teachers and school leaders which exhibit a low level of cross-school mobility (Gustafsson, 2016; Wills, 2015). Teacher moves that are made are typically to nearby schools, further limiting their experience of new teaching environments.

Table 9: Multivariate estimations (excluding district fixed effects). Recommendations and performance of schools in Gauteng, KwaZulu-Natal and Limpopo.

	A: Coefficient on D_s: recommended (1), not mentioned (0)		**B: Coefficient on R_1 - R_6: Recommendation source. Reference category "not mentioned"**						
		R2 / N	district officials	Secondary feeder	Lower perf. primary	Better perf. Primary	NGO respondents	Other	R2 / N
Performance outcomes:									
Composite performance 2012-2014 year [z-score]	0.10***	0.39	0.01	0.01	0.31***	0.20***	0.12	0.04	0.39
	(0.03)	7347	(0.04)	(0.06)	(0.06)	(0.07)	(0.08)	(0.09)	7347
Composite performance 2012 [z-score]	0.10***	0.31	0.04	0.01	0.34***	0.22**	0.05	0	0.31
	(0.03)	7347	(0.05)	(0.07)	(0.07)	(0.09)	(0.09)	(0.11)	7347
Composite performance 2014 [z-score]	0.12***	0.34	0.03	0.05	0.31***	0.23***	0.15	0.09	0.34
	(0.03)	7346	(0.05)	(0.07)	(0.07)	(0.09)	(0.09)	(0.11)	7346
Gr. 3 HL 2012 (%)	1.21*	0.13	0.78	0.02	4.51***	1.65	0.24	-1.02	0.13
	(0.65)	6692	(1.11)	(1.38)	(1.46)	(1.80)	(1.86)	(2.42)	6692
Gr. 3 math. 2012 (%)	0.67	0.15	-0.55	-0.61	5.67***	-0.08	0.9	-2.25	0.15
	(0.73)	6774	(1.25)	(1.55)	(1.62)	(2.10)	(2.14)	(2.62)	6774
Gr. 6 FAL 2012 (%)	3.02***	0.22	0.93	2.66	7.15***	4.79**	1.48	1.61	0.22
	(0.74)	4698	(1.24)	(1.70)	(1.55)	(2.01)	(2.05)	(2.98)	4698
Gr. 6 math. 2014 (%)	1.89***	0.21	-0.16	0.13	6.36***	4.78***	1.24	1.14	0.21
	(0.63)	6082	(1.08)	(1.29)	(1.38)	(1.76)	(1.82)	(2.45)	6082
Gr. 3 HL 2014 (%)	1.75***	0.21	1.91*	0.59	2.80*	2.44	0.11	2.98	0.21
	(0.65)	7234	(1.10)	(1.39)	(1.44)	(1.82)	(1.89)	(2.31)	7234
Gr. 3 math. 2014 (%)	0.67	0.28	0.19	-0.1	2.24	-0.32	1.08	2.03	0.28
	(0.64)	7261	(1.09)	(1.37)	(1.42)	(1.79)	(1.87)	(2.28)	7261
Gr. 6 FAL 2014 (%)	1.57**	0.18	0.18	-0.3	5.99***	3.48*	1.62	-0.81	0.18
	(0.68)	5596	(1.09)	(1.58)	(1.49)	(2.06)	(1.86)	(2.45)	5596
Gr. 6 math. 2014 (%)	1.59**	0.3	-0.94	1.18	4.18***	5.44***	1.71	1.42	0.3
	(0.65)	6715	(1.11)	(1.35)	(1.43)	(1.83)	(1.92)	(2.37)	6715

		R2 / *N*	district officials	Secondary feeder	Lower perf. primary	Better perf. Primary	NGO respondents	Other	R2 / *N*
Enrolment growth									
Enrolment growth 2012-2016 (%)	3.63***	0.1	4.28**	1.05	1.29	1.37	11.36***	6.27	0.1
	(1.13)	*7214*	(1.92)	(2.41)	(2.51)	(3.19)	(3.33)	(4.06)	7214
Enrolment growth 2012-2014 (%)	1.18	0.05	1.54	-0.95	0.35	-2.26	6.89***	5.24*	0.05
	(0.81)	*7319*	(1.36)	(1.71)	(1.79)	(2.27)	(2.42)	(2.89)	7319
Enrolment growth 2014-2016 (%)	3.04***	0.06	2.76*	6.00***	1.2	2.69	3.22	0.78	0.06
	(0.84)	*7189*	(1.41)	(1.77)	(1.85)	(2.37)	(2.50)	(2.99)	7189

Data source: Collected school recommendations dataset. **Notes:** Controls for quintile status, wealth index derived from 2011 Census small area places and its square, province, pupil to teacher ratios (2012), indicators for LOLT. Significant at *10% level, **5% level, ***1% level

Table 10: Multivariate estimations (including district fixed effects). Recommendations and performance of schools in Gauteng, KwaZulu-Natal and Limpopo.

	A: Coefficient on D_s: Recommended (1), not mentioned (0)	B: Coefficient on R_1 - R_6: Recommendation source. Reference category "not mentioned"							
		District official	Secondary Feeder	Lower perf. primary	Better perf. primary	NGO respondents	Other	R2-Within	N-groups/N
Performance outcomes:									
Composite performance 2012-2014 (z-score)	0.08***	0.05	0.02	0.36***	0.20***	0.13**	0.04	0.05	37
	(0.02)	(0.04)	(0.05)	(0.06)	(0.08)	(0.07)	(0.11)		7008
Composite performance 2012 (z-score)	0.08***	0.09*	0.03	0.38***	0.20**	0.07	-0.01	0.06	37
	(0.03)	(0.05)	(0.06)	(0.07)	(0.08)	(0.07)	(0.12)		7008
Composite performance 2014 (z-score)	0.10***	0.06	0.06	0.35***	0.24***	0.17**	0.09	0.03	37
	(0.03)	(0.05)	(0.06)	(0.07)	(0.09)	(0.08)	(0.10)		7007
HL Gr. 3 2012 (%)	0.85	1.81*	0.55	5.63***	1.49	0.63	-0.58	0.03	37
	(0.72)	(1.04)	(1.39)	(1.29)	(1.42)	(1.82)	(2.50)		6162
Math Gr. 3 2012 (%)	0.2	0.28	0.5	6.73***	-1.07	1.24	-1.81	0.03	37
	(0.53)	(1.20)	(1.67)	(1.70)	(1.85)	(1.84)	(2.99)		6254
FAL Gr. 6 2012 (%)	2.66***	1.85	2.73*	7.90***	5.16***	1.97	1.74	0.05	37
	(0.73)	(1.23)	(1.49)	(1.51)	(1.90)	(1.24)	(2.97)		4824
Math Gr. 6 2012 (%)	1.50**	0.43	0.7	7.38***	4.33**	1.83	1.37	0.04	37
	(0.59)	(0.88)	(1.09)	(1.58)	(1.99)	(1.58)	(2.51)		5777
HL Gr. 3 2014 (%)	1.64**	2.70**	1.05	4.43***	3.01*	0.63	3.42	0.02	37
	(0.66)	(1.07)	(1.38)	(1.55)	(1.72)	(1.83)	(2.15)		6696
Math Gr. 3 2014 (%)	0.54	0.85	0.22	3.41**	0.13	1.53	2.68	0.02	37
	(0.66)	(1.06)	(1.38)	(1.49)	(1.87)	(1.64)	(2.34)		6722
FAL Gr. 6 2014 (%)	1.67**	1.12	0.68	6.96***	4.06**	2.37	0.31	0.03	37
	(0.80)	(1.03)	(1.47)	(1.57)	(1.62)	(1.94)	(2.34)		5828
Math Gr. 6 2014 (%)	0.7	-0.74	0.84	4.64***	5.20***	1.78	1.15	0.03	37
	(0.47)	(0.94)	(1.22)	(1.49)	(1.70)	(1.56)	(2.22)		6383
Enrolment growth measures:	-								
Enrol. Growth. 12-16 (%)	4.72***	6.60***	0.37	1.45	1.71	11.30*	3.69	0.02	37
	(1.19)	(2.17)	(2.30)	(1.56)	(1.83)	(5.97)	(3.34)		6861
Enrol. Growth 12-14 (%)	1.69*	1.81*	-0.11	0.62	-2.13	6.86	3.75*	0.02	37
	(0.84)	(0.98)	(1.33)	(1.05)	(2.13)	(4.69)	(2.25)		6982
Enrol. Growth 14-16 (%)	2.37**	4.56**	-0.18	0.9	2.43*	2.95**	-0.61	0.01	37
	(0.92)	(1.81)	(1.44)	(1.00)	(1.31)	(1.39)	(1.87)		6834

Data source: Collected school recommendations dataset. **Notes:** Controls for quintile status, wealth index derived from 2011 Census small area places and its square, province, pupil to teacher ratios (2012), indicators for LOLT. Significant at *10% level, **5% level, ***1% level

With a scarcity of best practice schools in poorer contexts and the lack of teacher exposure to more functional environments, teacher education and training must start filling a gap in this regard – disrupting existing frameworks for 'good' with clearer examples and practices of what this may look like. But we also need more information on primary school performance to establish standards and challenge the public's frame of reference on quality education.[22]

VI.   Conclusion

This paper set out to identify whether there are high-performing primary schools in the no-fee public school sector. Despite a rigorous search in three provinces, corroborating data from the shorted-lived Universal Annual National Assessments with collected recommendations on 'good' schools, we struggled to find no-fee primary schools that stand out as best practice examples in English literacy performance. There are only two schools of our 31-potential outlier sample, both low-fee-charging schools, with English literacy performance that exceeds the median and 90th percentile performance of the combined comparator middle-income countries participating in PIRLS.

It is evident that we should revise down our *a priori* assumptions of excellence within the no-fee system. But how does one reconcile a lack of existing best practice no-fee primary schools with some evidence of system-wide improvements (Reddy et al., 2016) and the media coverage of students from under-resourced schools that achieve excellent matric results? Dropout and merit-based entrance into some secondary schools may explain some of this (Hunter, 2015). But answers also lie in performance variation that exists within the no-fee system; the numbers of better students coming from this system due its size; and the presence of outlier or resilient students despite their background or the functionality of schools they attend.

Within our sample schools there is evidence of a continuum of school effectiveness. After discounting for student background factors which may underlie school performance differentials, two to three of our 31-potential outlier schools stood out from others. There are also schools that emerge as relatively more efficient than expected given the socio-economic characteristics of their student composition. These schools go unnoticed (or may be targeted by districts as being under-performing) if student results are considered in isolation of student socio-economic status. In the next phase of this study, qualitative insights will be gathered from the identified no-fee schools that are relatively outperforming our sample expectations. These insights, along with a second round of testing to obtain literacy gain scores, will provide increased clarity on the potential of schools in challenging contexts to create literacy learning environments.

This paper also provided evidence of national variation in the performance of no-fee schools. Striving for higher levels of quality is possible within the no-fee system. There is a middle-ground, a rightward movement away from dysfunction that can be reached. Nevertheless, despite variation that exists, finding schools that achieve *adequate* levels of literacy (roughly equivalent to low international benchmarks of learning in TIMSS and PIRLS) are rare as evidenced in the work by Kotze (2017) and confirmed here.

Encouragingly, however, even in underperforming school contexts there appear to be some outlier or resilient students who significantly outperform their peers. There may be significant gains to be had from recognising, supporting, and protecting this talent. More research is required to understand

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[22] It is possible that quality choices are made even in the absence of actual test information – this is observed in the ability of some system actors to identify better quality schools. However as Gomez, Chumacero, Paredes (2012) identify in the context of Chile, while parents were making choices aligned with better quality schools even in the absence of publicly disseminated data on school performance quality became an increasingly important determinant of school choice when results were made public.

what factors contribute to their success and how to further realise their potential, particularly in large class contexts where differentiated instruction suited to the ability levels of students may be challenging to implement.

Finally, with a scarcity of best-practice no-fee schools but the possibility that a continuum of effectiveness exists, collecting, and disseminating reliable system-wide information could go some way to assisting system actors to identify school performance variation. The analysis of school recommendations casts doubt on the current ability of some system actors, particularly district officials, to detect better quality schools. Faulty metrics such as enrolment growth are more likely to guide perceptions of quality, at least among our sample of district officials. However other system actors are better at detecting higher performance, possibly using other localised information to make these judgements. Supplementing localised information with standardised performance data may enable citizens to make more informed choices in sending their children to incrementally better institutions. Even if the poor can't access a school that is adequate, there may be gains to choosing a school slightly better than the next. As identified by Kotze (2017), quality effects are not just limited to attending former white or privileged schools. There are learning gains to be realised from attending better schools even within the no-fee system.

References

Boone, P., 2013. The surprisingly dire situation of children's education in rural West Africa: Results from the CREO Study in Guinea-Bissau (Comprehensive review of Education Outcomes) (No. 18971), NBER Working Paper Series. Cambridge, MA.

Burger, R.P., Teal, F.J., 2016. Convexity or Heterogeneity? Estimates of the Shape of the Earnings Profile, Unpublished paper presented at ReSEP workshop, 21 November 2016.

Carneiro, P., Das, J., Reis, H., 2013. Parental Valuation of School Attributes in Developing Countries: Evidence from Pakistan, Working Paper.

Christie, P., Butler, D., Potterton, M., 2007. Ministerial Committee on Schools that work. Report to the Minister of Education. Pretoria.

Day Ashley, L., Mcloughlin, C., Aslam, M., Engel, J., Wales, J., Rawal, S., Batley, Kingdon, G., Nicolai, S., Rose, P., 2014. The role and impact of private schools in developing countries: a rigorous review of the evidence.

De Kadt, J., Norris, S.A., Fleisch, B., Richter, L., Alvanides, S., 2014. Children's daily travel to school in Johannesburg- Soweto, South Africa: geography and school choice in the Birth to Twenty cohort study. Child. Geogr. 12, 170–188. doi:10.1080/14733285.2013.812304

Department of Basic Education (DBE), 2017. Minister Angie Motshekga hosts round table discussions on the NEEDU National Report on Schools That Work, 10 July 2017 [WWW Document]. URL http://www.education.gov.za/Newsroom/MediaRelease/tabid/347/ctl/Details/mid/5986/ItemID/4418/Default.aspx (accessed 7.21.17).

Department of Basic Education (DBE), 2016a. 2016 School Realities. Pretoria.

Department of Basic Education (DBE), 2016b. Report on progress in the schooling sector against key learner performance and attainment indicators. Report prepared by Gustafsson, M. Pretoria.

Fiske, E.B., Ladd, H.F., 2004. Elusive equity: education reform in post apartheid South Africa. Brookings Institution Press, Washington, D.C.

Glick, P., Sahn, D.E., 2006. The demand for primary schooling in Madagascar: Price , quality , and the choice between public and private providers. J. Dev. Econ. 79, 118–145. doi:10.1016/j.jdeveco.2005.01.001

Gomez, D., Chumacero, Romulo, A., Paredes, R.D., 2012. School choice and information. Estud. Econ. 39, 143–157.

Gustafsson, M., 2016. Teacher supply and the quality of schooling in South Africa Patterns over space and time (No. 03/16), Stellenbosch Economic Working Papers.

Hastings, J.S., Kane, T.J., Staiger, D.O., 2009. Heterogeneous Preferences and the Efficacy of Public School Choice, National Bureau of Economic Research Working Papers. Cambridge, MA.

Hoadley, U., Galant, J., 2015. The organisation of schools succeeding against the odds. South African Rev. Educ. 12, 29–52.

Howie, S., Combrink, C., Roux, K., Tshele, M., Mokoena, G.M., McLeod Palane, N., 2017. PIRLS Literacy 2016: South African Highlights Report. Pretoria.

Hunter, M., 2015. Schooling choice in South Africa: The limits of qualifications and the politics of race, class and symbolic power. Int. J. Educ. Dev. 43, 41–50. doi:10.1016/j.ijedudev.2015.04.004

Jansen, J., Blank, M., 2014. How to fix South Africa's schools: Lessons from schools that work.

Bookstorm.

Klitgaard, R.E., Hall, G.R., 1975. Are There Unusually Effective Schools? J. Hum. Resour. 10, 90–106. doi:10.2307/145121

Klitgaard, R.E., Hall, G.R., 1973. A Statistical Search for Unusually Effective Schools. Prepared for the Carnegie Corporation of New York. Santa Monica, California.

Kotze, J., 2017. Social Gradients, Early Childhood Education and Schools Performing Above the Demographic Expectation: Empirical Insights into Educational Issues. Stellenbosch University.

Lepine, A., 2015. School Reputation and School Choice in Brazil: a Regression Discontinuity Design (No. 2015–38), Working Paper Series.

Levy, B., Shumane, L., 2016. School governance is a fragmented political and bureaucratic environment: Case studies from South Africa's Eastern Cape Province (No. 84), ESID. Manchester, UK.

Moses, E., Van Der Berg, S., Rich, K., 2017. A society divided: How unequal education quality limits social mobility in South Africa. Synthesis report for the Programme to Support Pro-Poor Policy Development (PSPPD). Stellenbosch.

Msila, V., 2005. The education exodus: The flight from township schools. Africa Educ. Rev. 2, 173–188. doi:10.1080/18146620508566299

Read, L., Atinc, T.M., 2017. Information for accountability: Transparency and citizen engagement for improved service delivery in education systems.

Reddy, V., Visser, M., Winnar, L., Arends, F., Prinsloo, C., Isdale, K., 2016. TIMSS 2015 Highlights of Mathematics and Science Achievement of Grade 9 South African Learners. Pretoria.

Reddy, V., Zuze, T., Visser, M., Winnaar, L., Juan, A., Prinsloo, C., Arends, F., Rogers, S., 2015. Beyond Benchmarks. What twenty years of TIMSS data tell us about South African education. Human Sciences Research Council, Pretoria.

Reeves, C., 2017. The Early Grade Reading Study (EGRS): In depth Case Studies of Home Language Literacy Practices in Four Grade 2 Classrooms in Treatment 1 and 2 Schools (October 2016-January 2017). Pretoria.

Ross, L., 2016. The Prevalence of Cheating in National Standardised Assessments in South African Schools. University of Cape Town.

Schneider, M., Elacqua, G., Buckley, J., 2006. School choice in Chile: Is it class or the classroom? J. Policy Anal. Manag. 25, 577–601. doi:10.1002/pam.20192

Shepherd, D., 2017. The open door of learning - Access restricted: School effectiveness and efficiency across the South African education system. Stellenbosch University, Stellenbosch.

Spaull, N., van der Berg, S., Wills, G., Kotze, J., 2016. Laying Firm Foundations - Getting Reading Right. Final Report to the Zenex Foundation on poor student performance in Foundation Phase literacy. Stellenbosch.

Taylor, N., Draper, K., 2014. NEEDU National Report 2013: Teaching and learning in rural primary schools. Pretoria.

Van der Berg, S., 2015. What the annual national assessments can tell us about learning deficits over the education system and the school career year. South African J. Child. Educ. 5, 28–43.

Van der Berg, S., van Wyk, C., Burger, R., Kotzé, J., Piek, M., Rich, K., 2017. The performance of low fee

independent schools in South Africa - What can available data tell? (No. 01/2017), Stellenbosch Economic Working Papers. Stellenbosch.

Von Fintel, M., 2015. Social Mobility and Cohesion in post-apartheid South Africa. Stellenbosch University.

Von Fintel, M., Van Der Berg, S., 2017. What a difference a good school makes! Persistence in academic performance and the impact of school quality (No. 07/2017), Stellenbosch Working Paper Series.

Wills, G., 2015. Informing principal policy reforms in South Africa through data-based evidence. South African J. Child. Educ. 5, 95–122.

Zimmerman, L., Howie, S.J., Smit, B., 2012. Time to go back to the drawing board: organisation of primary school reading development in South Africa. Educ. Res. Eval. An Int. J. Theory Pract. 14, 215–232.

Zoch, A., 2016. Measuring social and economic mobility in South Africa: New approaches to well-known survey data concerns. Stellenbosch University.

Appendix 1: About the ESRC/DFID funded project entitled "Identifying exceptionalism and resilience among township and rural primary schools in South Africa"

"Identifying exceptionalism and resilience among township and rural primary schools in South Africa" more affectionately known as "Leadership for literacy" is an education research project lead by a multi-disciplinary team of investigators across Stellenbosch University, UCT, JET, UNISA and the Department of Basic Education. The project is funded by the Economic and Social Research Council (ESRC) and the Department for International Development (DFID) in the United Kingdom and runs over the period September 2016 to September 2018.

The res*earch team, headed by Professor Servaas van der Berg at Stellenbosch University, is joined by researchers Dr Nicholas Spaull, Professor Ursula Hoadley, Jaamia Galant (both at UCT), Dr Nick Taylor (JET), Dr Gabrielle Wills (Stellenbosch University) and David Carel (Stellenbosch University). The project is funded by the Economic and Social Research Council (ESRC) and the Department for International Development (DFID) in the United Kingdom and runs over the period September 2016 to September 2018.

Project objectives

The first objective of this research was to identify the number of exceptional rural and township primary schools in South Africa. This is critically important to ascertain where access to quality schooling is a major determinant of success in the labour market and social mobility. We sort out to establish how many no-fee rural and township schools exist and where they may be located? Annual National Assessment data provides a national set of data which can be analysed to answer this research question, but a decision was taken to empirically verify the performance of what may be 30 high-performing schools across a low, median, and high-performing province in South Africa using tests of literacy at the grade 3 and grade 6 level.

A second objective is to gain new insights into school leadership and management practices and how these may be linked to literacy outcomes in high achieving schools relative to average or low-achieving schools in challenging contexts. This will occur through qualitative in-depth school visits (Stage 2) and the further school visits that will generate thick descriptions of management and leadership practices. It will subsequently be further informed by the quantitative investigation, after development of the SLM instrument.

A third and central objective is the development of a new School Leadership and Management instrument that captures the actual practices and behaviours of teachers and principals in challenging contexts in Africa. This will be done using the information generated by Stages 2 and 3, the available international and national evidence. This is the instrument that will be administered in the 30 school pairs to be tested.

The fourth objective of the research project is to determine how predictive this SLM instrument is of academic achievement and school functionality in these schools in challenging contexts. The relatively small number of schools (60) limits the precision with which it would be possible to estimate this, but would be enough to establish the promise of this instrument for future studies.

Project method and design

Qualitative methods are critical to achieving 2 of the 4 objectives of the project, particularly investigating if and how leadership and management processes link to improved instruction and literacy outcomes. Where learning outcomes are strongly convexly related to socio-economic

compositional effects in schools, one approach to discounting for advantage in a qualitative study involves a comparative investigation in a nearby typical or underperforming school.

In this respect, the mixed methods approach of the project involved at the outset a matched pairs design. Each exceptional school is paired with a nearby 'typical' or underperforming school. The matched pairs approach assumes that given a similar geographical position each school pair should have the same socioeconomic characteristics, and be influenced by similar cultural/political/local factors. In this respect in making comparisons across a high-performing and low-performing school, one can factor out some unobserved characteristics from the qualitative findings.

Final schools selected
Eventually we visited and assessed students in 61 schools in three provinces of which 32 were potential high performing schools either overall in ANA and/or in grade 6 literacy outcomes. Due to school access challenges during fieldwork we surveyed only 29 pairs rather than 30 as initially intended (10 in Gauteng, 10 in KwaZulu-Natal, 9 in Limpopo). One Limpopo school which seemed to be high performing in ANA was visited but due to bad weather and strike action we could not access its intended underperforming pair. Instead we visited 2 additional schools which we heard may be good performers.

Fieldwork and data collected

After three days of intensive training of fieldworkers (one which involved administering instruments in a pilot school in the presence of trainers), quantitative fieldwork was conducted for one day in each of the 61 schools between 6 February-March 2017 by a team of three fieldworkers.

- The first fieldworker assessed 10-15 grade 3 students in African and English language Oral Reading Fluency and word recognition. Students were sampled by i) the teacher selecting his/her two best students and the remainder were randomly selected from the class list by selecting each '7th' student down the list. This was a one-on-one test, with information captured electronically in tablets.
- The second fieldworker administered
  - the written grade 6 literacy, comprehension, and vocabulary tests to an entire class. This was a pen-paper test.
  - Engaged in one-on-one reading and comprehension test with 10-15 grade 6 students from the same class (but selected in the same manner as for the grade 3 sample).
  - Ensured that the grade 6 teacher completed a teacher vocabulary test (the same as what was given to the grade 6 class).
- The third fieldworker administered several instruments to capture school characteristics, school climate, school functionality indicators, teacher perceptions and leadership and management practices in the school.
  - An anonymous self-administered educator survey to identify several factors including perceptions about management was handed out to all educators at the start of the school day. This was completed during the day, sealed in an envelope, and placed in a box.
  - A school functionality instrument was filled out by the fieldworker, capturing amongst other things teachers' presence and activity in the classroom. Specific times were set for doing school walk arounds and observations during break time.
  - A 60-minute interview was held with the school principal, and if there were any un-known answers the deputy principal was also consulted for missing answers.

- o A 45-minute interview with the grade 3 home language teacher of the tested class was administered.
- o A 45-minute interview with the grade 6 English language teacher of the grade 6 tested class was administered.
- o Grade 3 and 6 classroom and work book observations which were captured on tablets.

Appendix 2: Project design limits the available school options for sample consideration

Establishing a final sample of schools to visit for the ESRC/DFID project was further complicated by language and grade configuration requirements for language testing, national schools' data inaccuracies as well as the matched pair design of the project. But it was the language dimensions of the project that placed the greatest squeeze on our potential outlier sample.

Language squeeze on the sample

At the onset of the project our initial plan to use 2015, 2016 and 2017 universal ANA results which tests in maths and language ended abruptly with union resistance to the continuation of ANA in 2015. In response to this setback and to growing concerns about abysmally low levels of basic literacy skills being acquired in both African languages and English, a decision was taken to focus on just testing *literacy* outcomes at two critical grade transition points: grade 3 and grade 6. South African basic education at the primary level is split into three phases; the foundation phase (grades 1-3), the intermediate phase (grades 4-6) and grades 7 (senior phase). Students typically learn in their home language in grades 1-3, then a language switch to English takes place in grade 4. The curriculum assumes that children have acquired basic reading skills in both their home language and English by grade 3. Testing both African language and English proficiency at this point is an important indicator or the readiness of the child to proceed to further grades and keep pace with the demands of the national curriculum.

Test development became unavoidable, particularly in testing African language literacy at grade 3, because of a lack of existing tests. For the sake of cost and time, a decision was taken to develop reading tests at the grade 3 level in only two to three of the 11 official South African languages.[23] Given the predominance of isiZulu in KwaZulu-Natal and its proliferation in many other parts of the country, including Gauteng, this was an obvious test language of choice. Anticipating a shortage of acceptable schools in Limpopo with its well accepted low levels of learning at the primary school level relative to other provinces, we expanded the language of testing to two areas: Sepedi and Xitsonga.

Despite testing in the most frequently occurring languages in these provinces, the best performing provincial schools in ANA are not dominated by one language group. In Limpopo, Tshivenda schools could not be considered as potential outlier schools for our sample. In the case of Gauteng, we discovered that schools with an unexpected LOLT given provincial population dynamics are reflected among the best ANA performers. As an example, despite the very few number of isiXhosa speaking people in Gauteng, one or two of the apparent best ANA performing no-fee schools have isiXhosa as their dominant LOLT.

In Gauteng with its highly diverse population dynamics in terms of home language, the consequence of migration to this economic centre, the process of identifying schools that fitted our language profile was particularly problematic. Given diverse languages and/or parent preferences for children to be taught in English, some 'outlier' township and rural no-fee schools have opted for English as their foundation phase LOLT. Initially we wanted to limit our sample to only schools teaching in African

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home language in the foundation phase. The options became so limited that we had no choice but to lift this criterion and include a few English LOLT schools in our sample, provided the dominant home language of the class matched our language testing area.

Inaccuracies in national data on schools

Determining whether schools fitted our profile was further exacerbated by data challenges, where national data on the language of learning and teaching in a school, its grade configurations (collected in the Annual Survey of Schools) and fee-charging status is often outdated or contains inaccurate information. This required hundreds of phone calls to obtain working phone numbers of schools or their principals (EMIS data is terribly inaccurate particularly in Limpopo and KZN) before verifying this information. There are some 'outlier' primary schools that only offer lower primary grades, only higher primary grades or some other grade configuration preventing testing both grade 3 and grade 6 in the same school.

Matched design limitations

The mixed methods design of the project hinged upon a matched schools approach. This meant that a selected high performer on ANA with a specific language and grade configuration would need to be matched with similar school nearby (with the same language and grade configuration). We tried as much as possible to find an under-performing or typically performing school with similar language profile of students, language of learning and teaching, fee structure and roughly comparable enrolment size; however, matching on all factors was at times impossible (no such match existed) and in a few cases involved choosing school pairs that were further away than initially intended. The success of the matching become a strong determinant when filtering down the list of potential higher performing schools to visit.

The success of a matched approach assumes that there is a random geographic spread of performance. But performance often occurs in clusters – in other words schools surrounding a potential outlier school are all doing relatively well so that there may be little visible performance differential across the schools. In Gauteng province and parts of Limpopo province this is a major issue. When the performance metric on which selection is based is potentially a noisy measure of actual learner proficiency, finding significant performance differences in learning across pairs is not guaranteed. Verifying that a school is a typical or bad performer is likely to be equally as challenging as identifying good performer.

A-Figure 1: Outlier schools vs matched pairs, distribution of grade 6 total marks obtained across 2 PIRLS comprehension tests and vocabulary tests
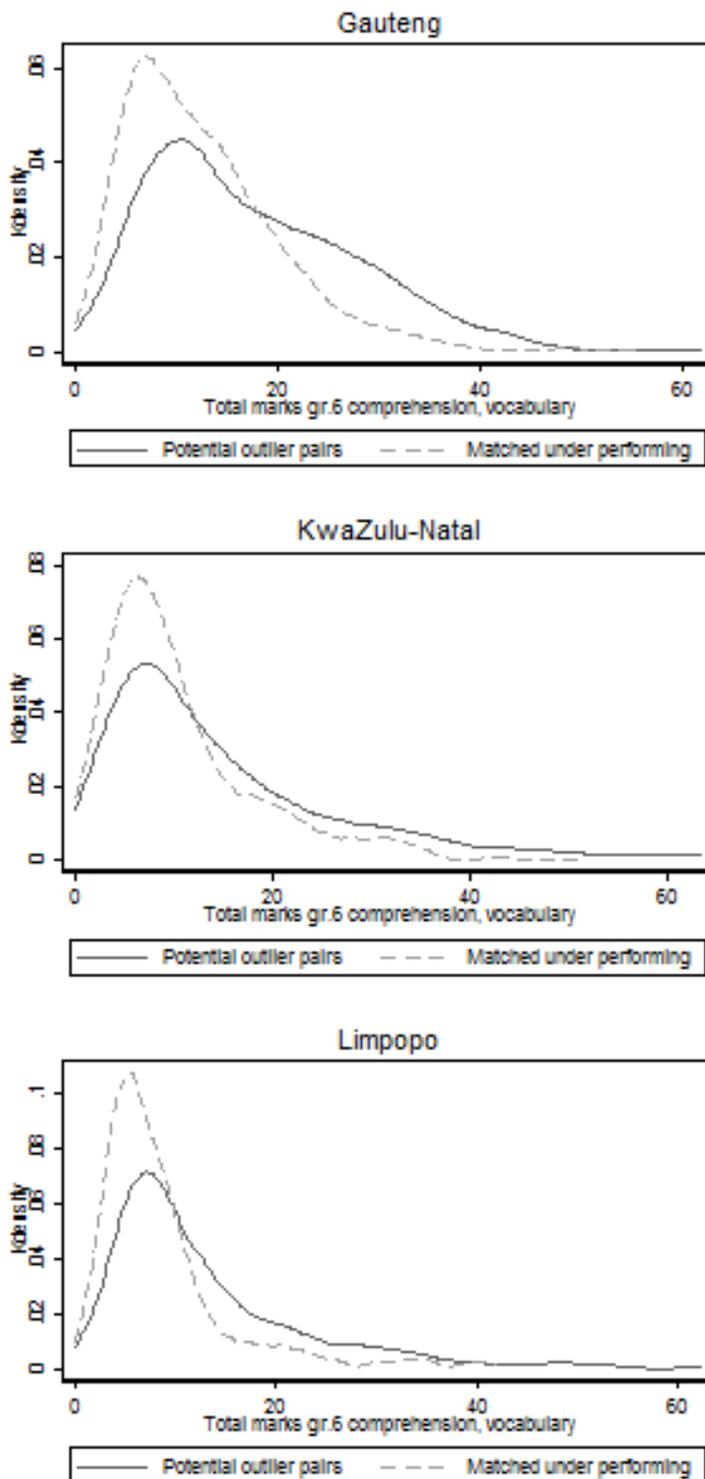
A-Table 1: Percentage of pairs where the potential outlier school outperformed the potentially under-performing matched pair using a variety of performance metrics

	Percentage of pairs where potential outlier pair performance exceeds matched pair performance
PIRLS text 1 - 50th percentile	60.7%
PIRLS text 1 - 90th percentile	75.0%
PIRLS text 2 - 50th percentile	64.3%
PIRLS text 2 - 90th percentile	75.0%
Total marks - 10th percentile	64.3%
Total marks - 50th percentile	75.0%
Total marks - 90th percentile	82.1%

Notes: There were 28 pairs. Unconditional performance that does not adjust for socio-economic status of learners.

A-Table 2: 10th and 90th percentile composite performance in ANA

		ANA Composite performance 3 year (z-score)			
		10th percentile	**90th percentile**	**Difference**	**N schools**
Gauteng	Quintile 1-3	-0.46	0.73	1.19	730
	Quintile 4	-0.32	1.07	1.39	242
	Quintile 5	0.37	1.81	1.43	402
KwaZulu-Natal	Quintile 1-3	-0.65	0.84	1.50	3371
	Quintile 4	-0.43	1.13	1.57	370
	Quintile 5	0.04	1.74	1.70	295
Limpopo	Quintile 1-3	-1.07	0.35	1.42	2336
	Quintile 4	0.25	1.63	1.38	10
	Quintile 5	0.13	1.61	1.48	31
National	Quintile 1-3	-0.86	0.63	1.49	13976
	Quintile 4	-0.38	1.11	1.49	1217
	Quintile 5	0.11	1.83	1.73	1341

Source: ANA 2012-2014. **Notes:** Composite performance is a z-score derived from average school performance across grades, subjects, and years.

A-Table 3: PIRLS analysis of the two comprehension tests used, proportional mark allocations by type of item

Type of questions	Text 2 Purposes for reading: Acquire and Use Information	Text 1 Purposes for reading: Literary Experience	Both texts
Examine and Evaluate Content, Language, and Textual Elements	11.1%	12.5%	11.8%
Focus on and Retrieve Explicitly Stated Information	22.2%	31.3%	26.5%
Interpret and Integrate Ideas and Information	38.9%	43.8%	41.2%
Make straightforward Inferences	27.8%	12.5%	20.6%
Grand Total	**100.0%**	**100.0%**	**100.0%**
Maximum possible marks	**18**	**16**	**34**
Grade appropriate word analysis*	**Gr 3.3**	**Gr 5.3**	

Source: Own analysis of PIRLS 2011, and PIRLS 2011 item information files (TIMSS 2011 Assessment and/or PIRLS 2011 Assessment. Copyright © 2013 International Association for the Evaluation of Educational Achievement (IEA). Publisher: TIMSS & PIRLS International Study Center, Lynch School of Education, Boston College.) *Internal word analysis.

A-Figure 2: Nearest neighbour analysis of recommended schools from a respondent in a primary school location