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PRO-POOR PRIMR: IMPROVING EARLY LITERACY SKILLS FOR CHILDREN FROM LOW-INCOME FAMILIES IN KENYA

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PRO-POOR PRIMR: IMPROVING EARLY LITERACY SKILLS FOR CHILDREN FROM LOW-INCOME FAMILIES IN KENYA

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ABSTRACT

Children from low-income families are at risk of learning outcome difficulties, particularly in literacy. Various studies link poor literacy results with performance later in primary and secondary school, and suggest that poverty, literacy skills and weak instructional methods combine to drastically limit the educational opportunities for many poor children. The Primary Math and Reading (PRIMR) Initiative was designed to support the learning gains of Class 1 and 2 pupils in seven counties across Kenya. PRIMR uses a randomised controlled trial design to establish the effect of its intervention and employs basic literacy measures to estimate causal effects. This study shows that PRIMR has been effective for children from low-income families and that early literacy interventions can mitigate socio-economic effects. The findings suggest that efforts to improve literacy outcomes for the poor should begin early in primary school. Strategies for ensuring that instruction is equitable across socio-economic status are advocated.



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1. INTRODUCTION

Socio-economic background has a substantial impact on learning achievement for children in Kenya (Lewin, Wasanga, Wanderi, and Somerset 2011; Uwezo 2011; 2012). Despite the narrowing of attainment differentials, the unprecedented resource transfers to schools under the Free Primary Education programme, and large inflows of pupils, achievement has remained low in sub-Saharan Africa, including Kenya (Ackers, Migoli, and Nzomo 2001; Barrett 2011; Oswald and Moriarty 2009). Slow educational progress constrains citizens' upward mobility and limits the acquisition of the skills required for the economic growth needed to make Kenya an industrialised country according to Vision 2030 (Republic of Kenya 2007). Challenges to the quality of education in Kenya have been demonstrated by a number of assessments, including the National Assessment System, for Monitoring Learner Achievement (NASMLA), the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) (Wasanga, Ogle and Wambua 2011), the Uwezo studies (Uwezo 2011; 2012), and the Early Grade Reading and Math Assessment (EGRA and EGMA) research (Piper 2010; Piper and Mugenda 2013).

Underachievement in Kenyan schools has been attributed to a variety of factors. For example, Bush and Oduro (2006) pointed to inadequate leadership. Other Kenyan scholars have cited poor teaching input (Odhiambo 2008), pupils' age or socio-economic background, and pupil-teacher ratio as key determinants of learning outcomes (Hungu and Thuku 2010; Wasanga et al. 2011), whilst others have focused on curriculum design (Bunyi 2013).

Kenya has significant socio-economic heterogeneity. The vestiges of the colonial education system and the geopolitical economy of post-independence Kenya seem to have developed an education system that favours the socio-economically advantaged (Abagi and Odipo 1997). Parents who feel that quality in public schools is compromised by over-enrolment often choose to take their children to private schools. In low-income communities, many parents opt for low-cost private schools, even if this means spending a substantial part of their income on their children's schooling (Tooley, Dixon and Stanfield 2008). Ironically, achievement in low-cost private schools is not significantly better than that in public schools, and the poor continue to be disadvantaged (Piper and Mugenda 2012; Dixon, Tooley, and Schagen 2013). The growth of private education – as evidenced by the Uwezo studies (Uwezo 2011; 2012) – suggests that poverty, and socio-economic status in general, is an essential factor in learning achievement in Kenya.

2. POVERTY AND LEARNING ACHIEVEMENT

Despite impressive economic growth since independence, Kenya is still among the world's 30 poorest countries (Collier 2008; World Bank 2006). Income inequalities are substantial, as the top 10% of Kenyans earn 44% of the national income, while the bottom 10% earns less than 1% (Republic of Kenya 2012a). Although Kenya has made efforts to address poverty (Alkire and Roche 2013), many families still earn less than the equivalent of one U.S. dollar a day (Republic of Kenya 2012a), and many, even most, Kenyan children come from low-level economic backgrounds.

According to the World Bank (1990), poverty is 'the inability to attain a minimum standard of living' (p. 26). The poverty line is 'the expenditure necessary to buy a minimum standard of nutrition and other basic necessities and a further amount that varies from country to country, reflecting the cost of participating in everyday life of society' (World Bank 1990, 26). These definitions imply that poverty has compound dimensions characterised by deprivation, vulnerability and weak capacity to cope with shocks (Verner and Alda 2004).

Collier (2008) argued that the poor need education to build the social and economic capital necessary to resuscitate what he defined as failed states. According to the United Nations Children's Fund (Belamy 2004), 'Poverty threatens every right, depriving children of the capacities they require to survive, develop and thrive' (p. 36). Research has demonstrated correlations between poverty and various measures of child achievement in education, health, and behaviour (Brooker et al. 2010). Heady (2003) stated that, for the poor relative to non-poor children, the risk was 2 times as high for repetition and dropout, 1.4 times as high for having a learning disability, and 1.3 times as high for having emotional or behavioural problems.

Poverty impacts education in disparate ways, including in poor reading outcomes. Consequently, high rates of reading failure – exacerbated by poverty – have been reported among children from sub-Saharan Africa (Belamy 2004). Scheerens and Creemers (1989) showed that family background had significant impacts on learning outcomes. Even so, the causal chain between poverty and illiteracy remains unclear and likely works in a symbiotic fashion (Maiyo and Jyoti 2011). Education helps to reduce poverty by increasing the efficiency of the labour force, whilst poverty denies the poor access to education because of poor nutrition, health, home circumstances, quality, and costs (Oketch, Mutisya, and Sagwe 2012). Education is considered an important strategy in fighting poverty.

Interventions to mitigate the effects of poverty in education have been undertaken at the national (Free Primary Education in Kenya) and international levels (the Education for All [EFA] and the Millennium Development Goal movements). In Kenya, these initiatives have made access to school more equitable and have put gender parity in enrolment within reach (Lucas and Mbithi 2012). Unlike those other indicators, however, learning achievement has not improved significantly (Kenya

National Examinations Council [KNEC], 2013; Piper and Mugenda 2012; Uwezo 2012).

Kenya's education system emphasises high-stakes examinations and does not focus on the competencies acquired at the pupil level (Ministry of Education, Science and Technology [MoEST], 2012). Some argue that teaching in Kenya focuses on examinations, to the detriment of competency-based knowledge (Hungu and Thuku 2010; Kenya Institute of Education [KIE], 2010; Lucas and Mbithi 2012). As a result, in some schools, the entire instructional focus is examination preparation. According to Oketch and Somerset (2010), teaching in the lower classes is largely ignored as the focus is directed towards the upper classes, primarily Classes 7 and 8. Unfortunately, this approach undermines the foundation of learners, especially in the essential skills of literacy and numeracy. The literature also indicates that pupils from low-income families are the most disadvantaged (Hungu 2008), as they are less likely to afford exam preparation courses or tutoring, or to have reading materials at home (Piper and Mugenda 2012). It might be that the additional costs incurred by families of pupils in Classes 7 and 8 to improve a child's chances of passing examinations are causally linked to a weak foundation in literacy and numeracy (Hungu and Thuku 2010).

As with other learning outcomes, poverty has a negative impact on literacy. Connor et al. (2009) conducted a cluster-randomised controlled field trial in selected high-to moderate-poverty schools. They examined the effects of individualising literacy instruction. The results revealed that intervention teachers individualised instruction better than teachers in control schools did. Importantly, as the children received the recommended instruction, their literacy levels improved, thus providing evidence that the quality and quantity of the teacher-child interaction had an influence on literacy outcomes. According to Whitehurst and Lonigan (2008), early intervention programmes designed to develop oral literacy skills are vital for poor children at school entry.

White, Leavy, and Masters (2013), in the Young Lives study of childhood poverty, revealed that characteristics of teachers – such as experience, gender, content knowledge and subject specialisation – had no significant influence on children's learning outcomes. Important determinants of students' test scores instead included instructional practices such as regularly checking homework, the proximity of the teacher's residence to the school, the teacher's attitude towards children, and teachers' perceptions of their schools. It is what the teacher 'believes and does' in class that has an impact on children's learning outcomes (Singh and Sarkar 2012). Dubeck, Jukes and Okello (2012) explored literacy instruction in lower primary schools in Kenya. Their recommendations included focusing on helping those from low-income families to develop oral language skills, promoting pupils' strong understanding of the relationship between letters and sounds, and granting the teachers serving these pupils opportunities for ongoing in-service teacher professional development.

The range of suggested remedies for the impact of poverty on literacy outcomes is wide. These interventions have included the removal of school fees, supply of uniforms, low-cost private schools for the poor, and provision of textbooks. Sadly, few of these interventions have resulted in significant impacts on literacy achievement for learners from poor families (Duy Khe et al. 2003; Hawkes and Ugur 2012; Heady 2003; Maiyo and Jyoti 2011; Oketch and Somerset 2010).

3. THE PRIMARY MATH AND READING INITIATIVE: BACKGROUND

The Primary Math and Reading (PRIMR) Initiative is a research study and intervention organised by the MoEST and funded by the United States Agency for International Development (USAID)/Kenya and the United Kingdom Department for International Development (DFID/Kenya). The PRIMR technical team works in close collaboration with the MoEST and various semi-autonomous government agencies, such as the Kenya Institute of Curriculum Development (KICD) and the Teachers' Service Commission. RTI International¹ provides technical support for the implementation of PRIMR in Classes 1 and 2. PRIMR is being funded by USAID/Kenya in 547 schools between 2011 and 2014 and by DFID/Kenya in 834 schools from 2012 to 2015. The programme covers seven of Kenya's 47 counties and, as of 2014, the programme was supporting literacy and numeracy instruction for more than 130,000 pupils.

PRIMR contains four main elements, all of which centre on helping teachers improve the quality of the content and pedagogy in literacy and numeracy. The first element is instructional materials. Based on the KICD curriculum, the PRIMR materials teach pupils the basic strategies needed for bilingual literacy and basic numeracy. The core materials are the PRIMR-designed pupil books, which provide literacy and numeracy activities with a pacing of one page per day. The second element is teachers' guides matched with the pupils' books. Based on PRIMR's theoretical perspective on the most efficient way to change teacher decision-making and improve instructional practice, PRIMR teachers' guides provide explicit instructions on how to effectively teach the key components of literacy and how to match instruction with the content of the pupils' books. The third element is teacher training methods that focus primarily on modelling and practice of new instructional techniques. PRIMR's analytical and progress reports discuss two challenges: making instructional changes in the teaching profession, due to a mismatch between how adults (in this case, teachers) decide to change behaviour; and adjusting how trainings are organised (Piper and Mugenda 2013). This third element of PRIMR – that is, teacher training – focuses heavily on modelling good instructional techniques and on ensuring that teachers practice the new methods during the training time. The final element of PRIMR is ongoing instructional support in the classrooms. PRIMR facilitates the

Teachers' Advisory Centre (TAC) tutors employed and deployed to public schools by the Teachers' Service Commission, as well as instructional coaches working in low-cost private schools, to make consistent classroom visits to advise teachers as they try the new methods in their classrooms (Piper and Zuilkowski 2015). PRIMR TAC tutors and coaches visit classrooms every day, with the majority of teachers being seen at least once a month in the classroom. This is a fundamental change in how teachers and TAC tutors interact, and is an essential part of how teachers can change behaviour.

The PRIMR intervention is based on previous research that adopted similar models in Kenya (Crouch, Korda, and Mumo 2007), Liberia (Piper and Korda 2011), and Egypt (USAID/Egypt and Ministry of Education, Egypt, n.d.). PRIMR has an explicit focus on integrating the English and Kiswahili materials so that pupils learn letter sounds in Kiswahili, and then when they are taught in English, the pupils are told how the letters correspond with or differ from Kiswahili. This makes learning more efficient than teaching the same letters in the two languages in isolation. Moreover, the programme is unique because it specifically emphasises helping pupils (such as the poor) who have had no exposure to early childhood education to gain the basic skills beginning in Class 1. The process of learning to read and write is taught explicitly in a sequential step-by-step manner that reinforces the five components of reading (phonemic awareness, alphabetic principle, fluency, vocabulary and comprehension; see National Institute of Child Health and Human Development [US] 2000).

The PRIMR design was intended to improve instruction and help teachers change their decision-making processes (Piper and Mugenda 2012). Although the project did not explicitly target the poor, the basic strategies in teaching literacy and numeracy skills have proven to be effective in supporting pupils at risk for reading difficulties. PRIMR is organised in ways that align with how best to support those at risk. Whilst PRIMR is a literacy *and* numeracy programme, this paper focuses on the results of the literacy intervention.

4. PURPOSE AND RESEARCH QUESTIONS

The literature reviewed presents evidence around a few central ideas regarding the intersection of poverty and education quality in Kenya. The country has a large proportion of pupils from low-income families, and many Kenyan pupils are at risk due to their parental educational background, their speaking of a minority language, or their geographic location. Education statistics show clearly that Kenya's educational policies – including Free Primary Education – have dramatically improved educational access but have had little to no impact on the quality of the education system at the primary level. Poverty, in Kenya, has pernicious effects on educational outcomes, such that the poor are far less likely to perform at basic levels

of achievement than the non-poor. The literature review also revealed few examples of successful interventions that can improve the educational outcomes for the poor. The purpose of this paper is to examine the PRIMR literacy programme to determine whether it improves the quality of outcomes for the poor. The gaps in the literature identified above raise three fundamental research questions that this study attempted to answer.

- What is the impact of the PRIMR literacy improvement programme on the learning achievement of pupils from poor families?
- Is the PRIMR literacy improvement programme able to overcome the disadvantages associated with poverty?
- What are the implications of the impact of the PRIMR literacy programme on the poor for education policy in Kenya?

5. METHODOLOGY

5.1 The Early Grade Reading Assessment Measure

The Kenyan MoEST recognises literacy, numeracy and inquiry skills (the ability to read, write, compute, and research and process information), thinking skills (the ability to comprehend, synthesise, evaluate and apply information) and the teaching thereof as part of the core education outcomes (MoEST 2012). In this study, learning outcomes were measured by literacy outcomes for both Kiswahili and English using the Early Grade Reading Assessment. EGRA has been used in Kenya by several organisations in dozens of implementations since 2007 (Crouch 2011; Mount-Cors 2010; Piper, Zuilkowski, and Mugenda 2014; Ralaingita and Wetterberg 2011).

EGRA is one of many tools used to measure students' progress toward learning to read (Gove and Wetterberg 2011). It was established in response to the increasing demand for simplified tools to contribute to knowledge of learning outcomes. EGRA has been used as a diagnostic tool to determine regional or urban/rural outcomes; to summarise grade-level averages and to compare reading levels by sex, ethnic group, socioeconomic class, or other large social categories (Gove and Wetterberg 2011).

5.2 Instruments

For the purposes of this paper, we used three measures. First, we measured oral reading fluency (ORF) in English and Kiswahili. ORF is a timed measure derived from the number of correct words read in a minute. The ORF measure is equated to ensure comparability over time (Albano and Rodriguez 2012). Second, we measured reading comprehension as a percentage of correct responses on five questions of different types asked orally after the reading passage.² The last key variable is a measure of the proportion of pupils who read at the MoEST Class 2 benchmarks

of 65 words per minute in English and 45 words per minute in Kiswahili. These benchmarks were set in 2012 by the Kenya National Examinations Council. Third, we derived the PRIMR indicators of wealth from simple, reliable measures administered to pupils. Pupils were asked to indicate whether their family had access to a variety of specified key household items. The data analysts then created a total pupil wealth composite, which added together the number of those household items present, out of a possible total of nine.

5.3 Participants

The PRIMR study was focused on Class 1 and 2 pupils in sampled schools. The findings presented in this paper are derived from the baseline and end line assessments for the PRIMR Initiative. In the two assessments, a random sample of half of the schools within each zone or cluster was assessed in each round. A sub-sample of schools was followed over time to create a longitudinal study. At the school level, the assessment involved the systematic random sampling of Class 1 and 2 pupils in the schools, stratified by gender. The total number of pupils assessed at the baseline was 4,385 and at the end line was 4,222.

The results from the end line assessment in October 2013 indicated that the mean for the pupil wealth variable was 4.3 with a standard deviation (SD) of 1.6. The pupil wealth composite was further analysed to determine how to denote poverty. It was decided that 'poor' referred to any pupil who identified having three or fewer of the nine specified household items. In all, 32.8% of pupils were 'poor' at the baseline in January 2012 and 30.6% at the end line. This simple measure was confirmed by an examination of the PRIMR data by the project staff, as the two public school zones that had the lowest mean scores on the pupil wealth composite (2.9 and 3.2 respectively) were also the most rural and lowest performing zones in the sample. Similarly, the zone and cluster identified in Nairobi as being the most wealthy and highest performing at the baseline had the highest mean scores on the pupil wealth composite (at 5.8 and 4.8 respectively). At the end line, 34.4% of the control sample was considered poor, and 29.4% of the treatment sample was considered poor, indicating relatively well-balanced treatment groups. The analysis presented below is restricted to those pupils who were designated as 'poor' by this measure.

5.4 Procedures

The administration of the EGRA tools in the PRIMR initiative occurred in January 2012 (for the baseline) and October 2013 (for the end line). Assessors were trained by PRIMR staff prior to the data collection time period on reliably administering the assessment. At both the baseline and the end line, interrater reliability scores were above 90% (Piper and Mugenda 2012). Teams of assessors undertook data collection with initial quality control provided by the team supervisor at every school, and

then by the regional coordinator who supervised a county data collection site, and ultimately supervised by the PRIMR monitoring and evaluation staff members. In the baseline assessment, assessors used paper questionnaires and in the end line assessment, they used tablets loaded with electronic data collection software. In both studies, 20 pupils (10 Class 1 and 10 Class 2) were assessed, stratified by pupil gender.

5.5 Design and Weighting

For this paper, we used the randomised controlled trial design of PRIMR to estimate the impact of the literacy programme on pupil outcomes. In this design, zones and clusters of schools were selected randomly from the population of zones and clusters (all zones and clusters in Nairobi, Thika town in Kiambu county, and Nakuru county) and then assigned randomly to treatment groups (starting in 2012, in 2013, or in control zones in 2014). A total of 412 schools were eligible for the assessment. Eighty additional schools were part of an information and communication technology (ICT) pilot evaluation, which was part of PRIMR, but was not included in the research for this paper given the additional ICT elements in the treatment groups (Piper and Mugenda 2013).

The data were weighted to account for the nested nature of the samples. Weights were derived from the samples, and the data were fit in Stata using the svy set of commands for analysis. All results presented here use the weighted data and are representative of the universe of experimental schools in the PRIMR Initiative (Piper, Zuilkowski and Mugenda 2014).

5.6 Data Analysis

The random selection and assignment of zones and clusters to treatment groups allows for a straightforward analysis of the impact of PRIMR. The PRIMR design has treatment groups that began implementation in 2012 and those that started in 2013. Given that the programme has shown impacts for both the first and second cohorts (between 0.3 and 0.5 standard deviations), the analysis presented here combines the first and second cohorts and compares them with the control group (Piper and Mugenda 2014). Only one of the six outcome variables of interest was statistically significant between treatment and control groups at baseline, as seen in Table 1.

Table 1: Indicators statistically significant at baseline, for treatment and control groups

Indicator	Language	Treatment score	Control score	T-test	p-value
Oral reading fluency (words correct per minute [WCPM])	English	12.23	9.38	2.37	0.02*
	Kiswahili	8.98	8.02	1.04	0.30
Reading comprehension (percentage correct)	English	7.75	6.44	1.25	0.22
	Kiswahili	13.47	11.66	1.24	0.22
Proportion of readers (percentage of population)	English	3.10	2.02	1.05	0.29
	Kiswahili	2.63	2.16	0.50	0.62

* $p < .05$

6. RESULTS

Our first research question focuses on whether PRIMR has had a statistically significant impact on pupil achievement for those from poor families in Kenya. Table 2 presents the response to that question. It offers simple comparisons at the end line between pupil outcomes in treatment and control schools for poor pupils. The table shows statistically significant impacts of PRIMR at all grade levels, for both languages, and for both formal and non-formal schools. The Class 2 effect size for the impact of PRIMR on oral reading fluency ranged from 0.17 standard deviations for Kiswahili in Class 2 formal schools to 0.51 standard deviations for English in Class 1 non-formal schools. The effect size of the impact of PRIMR on reading comprehension ranged from 0.05 standard deviations in Class 2 formal schools in Kiswahili to 0.58 standard deviations for Kiswahili in Class 1 non-formal schools. For the proportion of pupils who met the MoEST reading benchmark, the range was from 0.46 standard deviations in English in Class 1 non-formal schools to 1.33 standard deviations for Kiswahili in Class 1 formal schools. While the magnitude of the PRIMR effect differed by language, grade and school type, the results show that PRIMR has improved literacy outcomes for the poor.

Table 2: Impact of PRIMR – Programme effects and effect sizes

Subtask	Language	Formal or Non-formal	Grade	Control			Treatment			Programme impact		
				Mean	Standard error	Standard error	Mean	Standard error	Standard error	Standard deviation	Programme effect	Effect size
Oral reading fluency (WCPM)	English	Formal	1	14.27	2.52	1.79	17.93	17.01	3.66	0.22		
			2	29.37	2.61	2.13	37.48	35.08	8.11	0.23		
	Non-formal	1	22.74	5.14	2.01	41.63	36.91	18.89	0.51			
		2	46.07	5.51	2.92	69.47	63.03	23.40	0.37			
	Kiswahili	Formal	1	10.60	1.36	1.35	13.77	12.97	3.17	0.24		
			2	21.32	1.64	1.68	25.30	24.12	3.98	0.17		
Reading comprehension (percentage correct)	English	Formal	1	14.02	3.11	1.10	23.49	21.13	9.47	0.45		
			2	27.73	2.53	1.29	38.04	35.20	10.31	0.29		
	Non-formal	1	5.52	2.37	2.04	10.47	9.23	4.95	0.54			
		2	14.82	3.46	2.75	20.55	18.85	5.73	0.30			
	Kiswahili	Non-formal	1	13.53	4.22	2.20	24.59	21.82	11.06	0.51		
			2	29.94	6.22	3.33	54.88	48.02	24.94	0.52		
Proportion of readers (percentage of population)	English	Formal	1	12.74	1.92	4.22	14.91	14.37	2.17	0.15		
			2	29.96	2.99	2.32	31.40	30.97	1.44	0.05		
	Non-formal	1	14.75	3.63	1.71	29.75	26.00	15.00	0.58			
		2	34.15	3.45	2.42	53.90	48.47	19.75	0.41			
	Kiswahili	Formal	1	2.15	2.08	1.64	4.21	3.69	2.06	0.56		
			2	9.42	3.40	2.80	19.89	16.79	10.47	0.62		
Proportion of readers (percentage of population)	English	Non-formal	1	9.40	4.13	2.88	16.07	14.41	6.67	0.46		
			2	22.20	5.83	3.81	53.41	44.82	31.21	0.70		
	Kiswahili	Formal	1	0.00	0.00	1.38	4.22	3.17	4.22	1.33		
			2	7.13	2.94	2.52	14.17	12.09	7.04	0.58		
	Non-formal	1	2.00	1.63	1.62	5.64	4.73	3.64	0.77			
		2	9.39	3.36	3.02	33.05	26.54	23.66	0.89			

In order to answer our second research question, which relates to the impact of PRIMR on the educational outcomes of the poor relative to the negative effect of being poor, we present our results in Figure 1. This figure takes the causal effect of PRIMR, as estimated from the models presented in Table 2 above, and compares it against the effect of being from a low-income family in Kenya. The poverty effect was derived by creating ordinary least squares (OLS) regression models with the key variables of interest as outcome variables and a dichotomous variable differentiating the poor from the non-poor as a predictor. This model was fit on the control schools for each group of pupils.

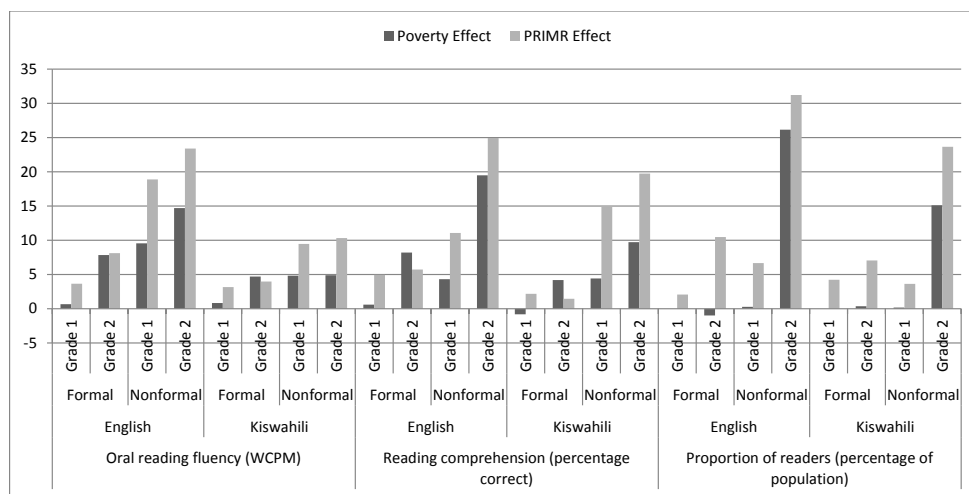


Figure 1: Comparison between PRIMR effect for the poor and the effect of poverty, by indicator, language, school type and class

Figure 1 shows that for most of the analyses, by indicator, language, school type and grade, the positive effect of PRIMR on the poor was greater than the negative effect of poverty, and often by a significant margin. For example, for English oral reading fluency in Class 2 formal schools, the treatment effect of PRIMR was 8.1 words per minute. On the other hand, the negative effect of poverty was 7.8 words per minute. In non-formal schools, which had a higher likelihood of the pupils being poor, the effects were greater. For Class 2 English oral reading fluency in non-formal schools, the treatment effect of PRIMR was 23.4 words per minute, compared with 14.7 words per minute as the negative effect of being poor. Remarkably, the effect of PRIMR on the poor was larger than the effect of poverty for every measure except Kiswahili reading comprehension in Class 2 formal schools.

This analysis does not paint the entire picture, however, because it simply compares how the poor have performed with and without PRIMR, and does not indicate how the well-off have performed under PRIMR. In order to understand

whether the poor are catching up with the non-poor, we carried out further analyses. Our regression models included the main effect of PRIMR, the main effect of poverty, and the interaction term between PRIMR and poverty. The analyses involved straightforward interactions between the PRIMR treatment groups and poor pupils in order to estimate whether the poor pupils in PRIMR are catching up with their non-poor colleagues. Table 3 presents the coefficients on the interactions between PRIMR and the poor, and the statistical significance. The table shows that, for four of the six measures, PRIMR provides a smaller boost to literacy improvement for the poor than for the non-poor. For Kiswahili oral reading fluency and the proportion of pupils at the ‘fluent’ level in Kiswahili, PRIMR has the same effect on the poor and the non-poor. On the other hand, for English oral reading fluency, English and Kiswahili reading comprehension, and English proportion of readers at benchmark, PRIMR’s impact is smaller for the poor than it is for the non-poor. This difference is explained in part, but not completely, by the lower baseline results of the poor.

Table 3: OLS regression results on the interaction between the poor and the PRIMR programme, by language and indicator

Indicator	Language	Poor pupil interaction with PRIMR	T-test	p-value
Oral reading fluency (WCPM)	English	-5.63	-2.29	0.023*
	Kiswahili	-2.05	-1.41	0.160
Reading comprehension (percentage correct)	English	-8.71	-2.93	0.004**
	Kiswahili	-5.94	-2.67	0.008**
Proportion of readers (percentage of population)	English	-9.28	-3.25	0.001**
	Kiswahili	-2.04	-0.93	0.354

* $p < .05$, ** $p < .01$

7. Discussion

The central focus of the field of international education since the 1990 Jomtien conference on Education for All has been on improving access and improving education quality. While the international community – and Kenya in particular – can claim a great deal of success in increasing access to education (Unterhalter 2013), improving quality has been much more difficult. A growing body of evidence in Kenya, including research from SACMEQ, NASMLA, EGRA and EGMA, has shown that learning outcomes are lower in early primary education than the MoEST expects. Several recent efforts have been undertaken to improve the learning outcomes for the poor, but the literature remains almost silent about examples of

programmes that have proven successful at helping the poor limit their disadvantage. This paper is an attempt to fill that gap in the literature.

Our first research question examined whether PRIMR was able to make a statistically significant impact on learning achievement in Kenya. Previous analyses (Piper and Mugenda 2013; Piper, Zuilkowski and Mugenda 2014) showed that the programme was successful in general, but this paper is the first analysis of whether the PRIMR programme has been successful for the poor. Our findings show that the programme has increased achievement, and quite effectively, with effect sizes of 0.31 SD for improving oral reading fluency, 0.38 SD for improving reading comprehension, and 0.74 SD for increasing the proportion of poor pupils who can read at the MoEST's benchmarks. These effects show that PRIMR is a highly effective programme for the poor.

These findings have implications for instructional improvement in Kenya, and potentially, in other sub-Saharan African contexts. Learning outcomes can be increased, using existing personnel in the educational system, and relatively quickly. Notable, however, is that PRIMR's effectiveness required the TAC tutors and coaches to invest significant amounts of instructional-support time observing teachers in the classroom and giving them feedback (Kisorkoi 2011). Without this focus, the results of PRIMR might not have been as significant. In addition, the results have implications for the design of literacy programmes. PRIMR is designed to help pupils who do not know their letters (or numbers) in either language. While more than 50% of pupils in Kenya have access to some sort of early childhood education, the poor have less access, and therefore, the experience of PRIMR suggests that having a literacy programme start from the very basic levels is likely to be more effective for those who are at risk for reading difficulties (Engle et al. 2011; Heckman and Masterov 2004; Nores and Barnett 2010).

The evidence of increased achievement among the poor is not sufficient, however, since it is important to know whether the effect is enough to ameliorate the disadvantages that poverty in Kenya creates. Our second research question required us to compare the impact of PRIMR to the impact of poverty. We found that, remarkably, PRIMR increases outcomes for the poor more than poverty reduces them. Our analyses show that, on average, PRIMR's impact is 4.2 times larger than the negative impact of poverty. However, given that PRIMR is not targeting the poor only, but also the non-poor, we analysed whether there was an interaction between poverty and PRIMR. We found, disappointingly, that, for four of the six comparisons within PRIMR, the gains for poor pupils were smaller than for the non-poor. It is important to be clear that poor pupils did improve, and improve quite a lot. Nonetheless, even the pro-poor aspects of a programme like PRIMR help the non-poor more than the poor. This is unsurprising, given the advantages that the non-poor have and the disadvantages of using OLS regression models for this sort of analysis. However, even within programmes targeting the bottom of the distribution,

more care should be given to ensure that pupils coming from poor backgrounds use these programmes.

The juxtaposition of equality and quality appears to be a recent shift in the international education aid architecture. Several donors, including USAID, DFID, and Global Partnership for Education, are concerned with improving learning. These organisations often note the low levels of learning in the sector, particularly in sub-Saharan Africa. Equity of learning outcomes appears not to have been a large part of the emphasis within this trend, apparently because of the assumption that learning outcomes are both evenly distributed and quite low. If the assumption is that learning outcomes can and will improve, however, thought should be given to measuring and intervening to ensure equity of learning outcomes, so that efforts to improve learning outcomes promote equity rather than expand inequity.

8. CONCLUSION

Since the Coleman report in the United States (Coleman 1966), the challenges of overcoming the tremendous effects of poverty on pupil achievement have beset educators worldwide. In Kenya, a country acutely aware of its responsibilities to improve the educational outcomes of the poor (Republic of Kenya 2012b), efforts have been made to focus attention on improving the quality of education. This is a notoriously difficult problem to solve, since outcomes are so heavily correlated with wealth, implying that improving education must go hand in hand with improving the economic situation of learners. However, in this study, we were able to examine whether and how the PRIMR programme could impact poverty outcomes in Kenya. The results were encouraging, both in PRIMR's overall effect and in the programme's ability to limit and lessen the disadvantages educationally of poverty. Still, our research showed that the poor benefit somewhat less from PRIMR than the rich. This suggests that more must be done to organise programmes specifically to help the poor so that the result of high-impact programmes is not increasing inequality.

We suggest the following policy recommendations. First, programmes like PRIMR should be well-funded enough to provide some of the supplementary teaching and learning materials needed to decrease the gap in access to ideas and content. This can be done at large scale through supplementary book programmes that target the poor and rural populations in countries like Kenya. Second, we recommend that programmes such as PRIMR invest more heavily with resources and manpower in poor and rural areas. This can overcome the tendency for programmes to do better where they are based. By putting its strongest technical staff where the need is highest, PRIMR could overcome this common pitfall. Third, programmes like PRIMR should have elements in which teachers and TAC tutors are directly and specifically engaged to target the poor and at-risk with additional attention. In PRIMR, teachers were asked to help those who were struggling with comprehension,

but socio-economic status did not play a role in deciding which pupils needed greater assistance.

Aggregate statistics often paint a dismal picture of literacy rates among the poor in Kenya (Bunyi 2013). Furthermore, the poor are unable to pay for mitigating services such as tuition for tutoring, or for personal reading books. That said, literacy is an important tool for improving the status of the poor, and innovative methodologies – such as PRIMR’s – for promoting early grade literacy can change the learning trajectory of children from low-income families. Specific pedagogical approaches used by PRIMR show that pupils are able to acquire literacy skills regardless of their socio-economic background or access to pre-primary education. The PRIMR literacy programme focuses on the instructional leadership of the TAC tutor, careful development of core reading skills (phonemic awareness, alphabetic principle, fluency, vocabulary and comprehension) and materials aligned to these pedagogies that can help lift the burden that poverty places on children’s access to literacy (Piper, Zuilkowski and Mugenda 2014). These results suggest that instructional improvement efforts can help ameliorate achievement gaps for pupils from different socio-economic statuses, and it holds out hope for the potential for these sorts of instructional programmes to limit achievement gaps related to other differences in pupil background.

This paper provides some encouragement within a large body of literature that shows very little progress in improving the quality of learning for the poor. We recommend some caution since PRIMR is only a pilot programme, albeit a medium-sized pilot programme. Without explicit attention to the poor and at-risk pupils, programmes such as PRIMR can lose their pro-poor effectiveness as they are brought to scale. We hope that the decisions of the MoEST will focus not only on providing quality education to Kenyans, but also specifically on enhancing the quality of education offered to the poor.

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NOTES

1. RTI International is a registered trademark and a name of Research Triangle Institute.
2. Full versions of each of the measures utilised at the baseline and end line assessments are available on the website of the USAID Education Data for Decision Making (EdData II) project, at <https://www.eddataglobal.org/countries/index.cfm?fuseaction=pubDetail&ID=416> and <https://www.eddataglobal.org/countries/index.cfm?fuseaction=pubDetail&ID=521>, respectively.

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