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Rural-urban gaps in sixth-graders' reading literacy scores in sub-Saharan Africa: Unequal opportunities and unequal results

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Abstract

Using data from SACMEQ II, this paper examines the disparities in reading literacy scores of sixth-graders between rural and urban areas in 14 school systems in southern and western Africa. Compared to their counterparts in urban areas, rural students on average had inferior literacy scores and lower levels of family socioeconomic status, were older in age, were more likely to have repeated a grade and had less home support for their academic work. Rural schools also compared unfavourably to urban schools in terms of the quality of school buildings, the number of school facilities and equipment, the number of instructional resources available to reading teachers and the general reading proficiency of teachers. The analysis shows that in addition to student demographic characteristics, differences in school context and resources were largely responsible for the rural-urban gaps in students' reading scores in these school systems. While highlighting the crucial role of school resources, the paper suggests that improving school processes and strengthening home support for children's academic work are also indispensable to eliminating the inequities in students' learning outcomes both between and within schools.

Introduction

Improving access to and the quality of primary schooling has been at the centre of such international initiatives as Education for All (EFA) and the Millennium Development Goals (UNESCO 2000; UN 2000). Recent results of the monitoring of progress towards achieving the EFA goals conclude that providing high quality schooling for all children, regardless of their sex, family background, linguistic and ethnic minority status, remains a challenge in less developed as well as industrialized countries (UNESCO 2002, 2003, 2004).

In the context of the less developed countries, rural education is often synonymous to disadvantage. This claim is certainly supported by evidence from sub-Saharan Africa where research on learning achievement indicates that even though there is no clear pattern of gender disparities among primary school students, those from rural areas consistently underperformed their urban counterparts by substantial margins (Kulpoo, 1998; Voigts, 1998; Machingaidze, Pfukani and Shumba, 1998; Nkamba and Kanyika, 1998; Nassor and Mohammed 1998; Nzomo, Kariuki and Guantai, 2001; Michaelowa 2004). Data from various international student assessments generally highlight the widespread under-achievement less developed countries, with students from rural areas being particularly vulnerable to under-achievement (UNESCO 2004). While rural disadvantage may be more prevalent or dramatic in less developed countries, it is certainly not a phenomenon unique to less developed countries. In an analysis of 24 industrialised countries participating in the OECD study of the literacy performance of 15-year-old students, Williams (2005) found that rural students scored considerably lower in mathematics than their counterparts in urban and medium-size communities in 14 countries.

There are complex factors shaping the learning disadvantage of particular groups of students within individual school systems. Comparative research on students' learning achievement, an essential measure of school quality, has focused on family backgrounds and school quality as two primary sources of influence. Heyneman and Loxley (1983) observed that schools tend to play a greater role in determining students' learning achievement in poorer countries than in wealthier countries. The reason is that schools in poorer countries vary much more than in wealthier countries in terms of school quality, such as the shortage of trained teachers and materials. Hence which school a child attends makes a big difference in how much a child learns regardless of his or her family backgrounds. Baker, Goesling and Letendre (2002) argued that this trend had changed since the time of the Heyneman-Loxley study, except in some very poor nations. Studying mathematics and science achievement in forty nations, Baker and colleagues identified a common trend of more consistent school quality and more impact of difference among families in resources on students' test scores. The authors attributed the vanishing of the Heyneman-Loxley effect to global mass schooling which took place over the three decades since the Heyneman-Loxley study, which brought about increased funding in education by most of the world's governments. The process of mass schooling allowed many educational systems to finally reach a resource threshold in quality within national systems of education, which reduced variation in school quality and thus softened the difference that once existed between wealthier and poorer nations regarding the influences of school quality.

Research from sub-Saharan Africa, however, suggests that the relationship between students' learning achievement and the socio-economic status (SES) of their family background is more complicated. Ross and Zuze (2004) demonstrated that six-

graders from well-to-do families tended to outperform their counterparts from disadvantaged family backgrounds in reading literacy scores in all 14 school systems in southern and western Africa, a mixture of low- and middle-income countries. Even though two school systems with the largest SES-related gaps in reading literacy scores in the study were middle-income countries, such gaps were actually smaller in other middle-income countries in the study than in some of the low-income countries.

To what extent do family backgrounds and school quality influence the learning achievement in sub-Saharan Africa? In a review of theories and empirical evidence on educational stratification, Buchmann and Hannum (2001) pointed out that due to the preoccupation with the "family versus schools" debate, few studies considered how family and school factors interact to produce educational stratification. To the extent that rural families tend to lag behind urban families in less developed countries and that rural schools are less well-resourced, students attending rural schools are subject to ‘double jeopardy’ in opportunities to learn.

Raudenbush and Willms (1995) and Willms (1992) described an input-process-output framework of examining the relationship between achievement and a variety of factors, grouping determinants of schooling outcomes into input and process variables at student, classroom, school, district and community levels. The input variables are generally regarded as exogenous—meaning that input variables at each level are out of the control of the people at the corresponding level—while the process variables are endogenous. For instance, student inputs include student gender, prior achievement, cognitive ability and family SES. Student process variables include quality of school life, sense of efficacy and attitudes towards school. The input variables at the class, school, and district and community levels include the size of the class, school or district, intake composition, resources and staffing

characteristics at each level. The process variables describe the contexts and setting of schools, as well as the internal workings of school life. Even though there is no consensus on what exactly constitute measures of school processes, generally they include disciplinary climate, academic press (emphasis on academic achievement and expectations for student success), teacher commitment and morale, etc (Scheerens, 2000). This framework is cognisant of the multilevel structure of the schooling system and makes an explicit effort to address the schooling processes. Because it highlights the role of actions that teachers, school administrators as well as students can take in influencing students' learning outcomes, the framework was adopted for this paper.

With a focus of explaining the forces shaping the gaps in learning achievement between urban and rural students, this paper used data from the second project of the Southern Africa Consortium for Monitoring Educational Quality, or SACMEQ II in 2000-2002[1], to explore the relationship between reading literacy and a host of individual and school characteristics of sixth-graders. It reveals that virtually all of the observed gaps between rural and urban schools were attributable to differences in students' demographic characteristics and indicators of the schools' physical and human resources – factors that are beyond the control of teachers and school administrators. Of particular significance, the paper shows that variables representing student and school processes – factors within the realm of educators – also played a role in "explaining away" the between- and within-school differences in reading literacy scores.

[1] SACMEQ was launched in 1995 and currently consists fifteen Ministries of Education in southern and west Africa: Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania (Mainland), Tanzania (Zanzibar), Uganda, Zambia, and Zimbabwe. The International Institute for Education Planning of UNESCO is also a member of the association. Its first study, or SACMEQ I, was conducted for seven Ministries of Education between 1995 and 1998.

Challenges in Improving Access and Quality of Education in sub-Saharan Africa

The most recent EFA Monitoring Report (UNESCO, 2004) concluded that in the decade following the announcement of the EFA goals in 1990, sub-Saharan Africa experienced progress towards universal primary education. The average net enrolment ratio (NER), the number of students enrolled in primary schools to the total number of children of primary school age, rose from 54 percent in 1990 to 58 percent in 1998 and 63 percent in 2001. Despite this expansion, in 2001 more than 40 million children of primary-school age were not in school. Only a handful of small states had NERs above 90 percent. The NERs in some larger countries were under 70 percent, or even 50 percent in the case of Burkina Faso, Eritrea, Ethiopia, Guinea Bissau and the Niger, indicating the need to expand their primary school system capacity in order to enrol all children. Meanwhile, delayed enrolment is widespread: 20 to 40 percent of children in first grade are at least two years above the official age. School completion is a major concern, with many children pushed out by costs, unfriendly school environments and/or the need to supplement family income. In half the countries the survival rate to grade 5 is below 67 percent and grade repetition is frequent. More than a quarter of all students are repeaters in countries such as Burundi, Cameroon, Chad, Comoros, Equatorial Guinea, Gabon, Madagascar, Rwanda, and Sao Tome and Principe (see Appendix A).

Participation is even lower at the higher levels of education. Although several countries have committed to some compulsory secondary education, a large proportion of primary school graduates do not make the transition to the next level. In 2001, the region's gross enrolment rate was only about 27 percent in secondary education, though the level of participation was above 50 percent in Botswana, Cape

Verde, Gabon, Mauritius, Namibia, Seychelles and South Africa. For countries for which there were data, participation at the tertiary level, participation was less than 2.5 percent in half of them.

Girls and women are at a disadvantage in schooling access in most of the countries. For every 100 boys enrolled in primary schools, there are only eighty-six girls. In addition, girls account for more than half of all out-of-school children at the primary school level. Disparities between the sexes are even worse at higher levels, with a ratio of 79 girls for every 100 boys enrolled in secondary education. More than 60 percent of the region's adult illiterates are women. As a consequence of low participation, a child in Sub-Saharan Africa can expect to receive, on average, seven years of education – six to nine years less than in Western Europe and the Americas.

In addition to low participation and survival rates, low levels of learning achievement also seem widespread in sub-Saharan Africa. In Malawi, for example, about 90 percent of children attended primary school in the mid-1990s but only about 30 percent survived to grade 5, and as few as 7 percent met minimally acceptable standards in reading at grade 6 as defined by their own national government. In seven southern African countries included in the SACMEQ I study (1995–98), between 1 percent and 37 percent of grade 6 students reached the 'desirable' level in reading while 22 to 65 percent were at 'minimum' level. In six of these countries, achievement levels fell in the late 1990s, by about 4 percent on average. In six French-speaking African countries, 14 to 43 percent of grade 5 students had 'low' achievement in either French or mathematics. Comparisons between two SACMEQ studies (1995–96 and 2000–2002) point to a 4 percent decline in literacy scores, with the biggest differences occurring in Malawi, Namibia and Zambia (UNESCO 2004).

Sub-Saharan Africa certainly faces tremendous challenges to improve schooling access while raising the quality of schooling for the overall population. While emphasising such dual challenges, it would be useful to understand the equity dimension of such challenges. Research from this region and other parts of the world suggests that the issue of equity reverberates throughout discussions of any other educational targets.

Research Questions

This study examined the relationship between learning achievement and a variety of student and school characteristics both *within* and *across* schools in the context of sub-Saharan Africa, thus shedding light on the role of schools in creating the observed inequities in learning achievement. It illustrated the intricate link between student demographic characteristics, their approaches to learning and access to quality school. More specifically, this paper explored the following questions:

1. How did the sixth-graders attending rural school compare to their urban counterparts in terms of their reading literacy scores? How different were they in terms of their individual characteristics? Were the rural schools also different from urban schools?
2. If there were disparities in reading literacy scores between rural and urban students, to what extent were such disparities related to the differences in their individual demographic characteristics? What about the individual processes variables?
3. Did school resources and processes play a role in "explaining away" the observed rural-urban gaps in students' reading literacy scores above and beyond students' individual characteristics?

4. To what extent were the overall inequalities in reading literacy scores attributable to differences in student individual characteristics, learning processes, as well as school resources and processes?

Data and Variables

The data used for this paper were collected by the second project of the Southern Africa Consortium for Monitoring Educational Quality (SACMEQ II). SACMEQ II is a study of the reading literacy and numeracy as well as school conditions of sixth-graders in 14 school systems in southern and western Africa. These systems were: Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Mainland Tanzania, Zanzibar of Tanzania, Uganda and Zambia. The data collection was carried out in 2000 for all participating countries except for Mauritius in 2001 and Malawi in 2002. One unique feature of the SACMEQ study is its design to explicitly address the general policy concerns of policy-makers in five areas, which are students' characteristics and learning environments, teachers' characteristics and viewpoints, school heads' characteristics and viewpoints, equity in the allocation of human and material resources, and the reading and mathematics achievement levels of students and their teachers. The SACMEQ study adopted a two-stage sampling procedure by which schools were first selected and then 20 Grade 6 students were randomly selected from each sampled school. In addition to a paper and pencil test on reading literacy and numeracy for students and six teachers randomly selected from the same school, separate background questionnaires were also completed by the students, teacher and school heads.

Outcome variable: reading literacy scores. The focus of the research questions is the rural-urban disparities in the sixth-graders' reading literacy scores, which were scaled to have a mean of 500 and a standard deviation of 100 for all students in the study using Item Response Theory method.

Individual inputs. Three variables representing the sixth-graders' individual characteristics were examined in the context of their relationship with the students' literacy scores. These variables include the students' age in months, whether the student was a girl (1 yes and 0 no), an index of the socio-economic status (SES) of the students' family background. The SES index was constructed using information about the highest level of schooling completed by the parents, household possessions, sources of lighting, as well as the material of the household floor, wall and roof. The value of the index ranges from 1 to 15, with greater values indicating higher levels of family SES.

Individual process variables. Two variables representing aspects of learning that are alterable at the student level, thus called individual processes, were examined. The first was a dummy variable indicating whether the student had ever repeated a grade (1 yes and 0 no). To the extent that a student sometimes is told to repeat a grade by the school because of undesirable academic performance, grade repetition is not within the realm of decision-making by the student or the parents. It was categorised as an individual process variable in this paper because 1) it is an individual trait; and 2) it is difficult to tell from the data whether grade repetition, when it happened, was a decision made by the student/parents or the school. The second individual process variable was a composite of home interest in the student's academic work. The composite was constructed on the basis of students' responses to questions about the frequency that somebody other than the teacher did the following: 1) made sure that

the student did the homework; 2) usually helped the student with homework; 3) asked the student to do work on school subjects; and 4) asked the student questions about what she or he did in school subjects. The composite was constructed in such a way that the greater value indicates higher level of home interest in the student's academic work and vice versa.

School input variables. This analysis looked at six variables representing the aspects of the schools that are usually regarded as given from the viewpoint of teachers and school principals, and thus are called school inputs. The first variable indicated whether the school was located in an urban area which includes small towns and large cities (1 if yes and 0 if no). The second reflected the overall family background of the student intake, which was the school average of the student SES index. These two variables are sometimes called school context. The next three variables reflected the level of physical resources, with one variable indicating that the school building was in relatively good condition (1 yes and 0 no), one variable indicating the number of school facilities and equipment, and the third one reflecting the number of instructional resources available to reading teachers. An important school input is the quality of teachers, and SACMEQ II administered a reading and numeracy test to six teachers from each sampled school. The common items on the test of students and teachers allowed the test results of teachers to be put on the same scale as that of the students. Thus the final school input variable was the average reading scores of the teachers of each school.

School process variables. Six variables representing school processes were selected on the basis of literature and availability of information in the background questionnaires. For instance, previous research suggests that effective schools generally share, among others, at the following characteristics: homework and

feedback to student learning, parental involvement in school work and monitoring and evaluation. Based on the information available from the background questionnaires, four variables were used to represent these aspects of school processes. The first was the student report of whether teacher assigned reading homework, and if yes whether teacher corrects such homework. The variable was aggregated to the school level. The second variable indicated whether the reading teacher frequently met with parents to discuss the student academic progress. The other two variables were also based on teacher reports, one a composite of the extent to which the visiting inspectors provided positive feedback to the teacher and the other the number of visits by inspectors between 1998 and 2000.

Two more composite variables were constructed on the basis of reports by the school head to represent the school processes. The first reflected the prevalence of such student behavioural problems as arriving late at school, absenteeism, skipping classes as well as alcohol abuse/possession and fights among students. The other reflected the prevalence of a variety of teacher behavioural problems, ranging from teachers arriving late at school, teacher absenteeism, intimidation or bullying of students to teacher health problems.

Methods of Data Analysis

The selection of the analytic strategy was determined on the basis of the individual research questions. In order to address the first research question, whether and to what extent differences existed between rural and urban students as well as the schools that they attended, a series of bivariate analyses were carried out to examine the relationship between the dummy variable representing the urbanicity and all the other individual- and school- level variables.

A series of two-level hierarchical linear models in the following format were fitted to the data from the fourteen schools systems to explore the rest of the research questions:

$$Y_{ij} = \beta_{0j} + \beta_{Qj} X_{Qij} + r_{ij}$$
$$\beta_{0j} = \gamma_{00} + \gamma_{01} URBAN + \gamma_{0Sj} W_{Sj} + u_{0j}$$
$$\beta_{qj} = \gamma_{q0}$$

where Y_{ij} was the reading literacy score for student *i* in school *j*; β_{Qj} a vector coefficients reflecting the estimated relationships between of reading literacy and a set of individual-level variables, *Xq* (*q=1,…Q*); β_{0j} the mean literacy score for school *j*; r_{0Sj} the estimated relationship between the school averages of reading literacy scores and a set of school-level variables, *Ws* (s=1,…S); γ_{00} the grand mean literacy score adjusted for the individual- and school-level characteristics. The term r_{ij} captured the difference between the score of student *i* and the mean score for school *j* and u_{oj} the deviation of the mean score for school *j* from the grand mean. The residuals, r_{ij} and $u_{oj,}$ are assumed to be normally distributed, with a mean of zero, and variances of σ^2 and τ_{00}.

Initially, a model without any predictors, or a 'null' model, was fitted to the data for each country. In this case, γ_{00} was the grand mean literacy score adjusted for design effects, and σ^2 and τ_{00} measured the variances in reading literacy scores that existed between- and within-schools. Then the dummy variable representing urbanicity was added to the model to estimate the extent of advantage that students attending urban schools had over their rural counterparts, γ_{01}. Following this, the individual- and school-level input and process variables were added to the models to detect the changes in γ_{01}, the urban advantage, as well as in σ^2 and τ_{00}, the between- and within-school variances in reading literacy scores.

Results

Rural-urban disparities in student and school characteristics

Table 1a provides the mean and standard deviation of all the student-level variables used in the analysis, as well as the rural-urban differences. As can be seen, the average reading scores ranged from 428 points in Malawi to 582 in Seychelles, a difference of more than a standard deviation. Countries differed not only in the average levels of students' reading scores but also in the variability of the test scores as indicated by the standard deviation of the mean scores. Generally, countries with higher levels of average reading scores tended to have greater variability among their students. The 14 school systems varied tremendously in terms of the advantage that urban students had over their rural counterparts in reading literacy scores, ranging from 7 points in Seychelles to 118 points in South Africa. The other school systems with an urban advantage of about a standard deviation or more included Kenya (48), Namibia (85), the mainland of Tanzania (72) and Zambia (57).

--- Insert Table 1a about here ---

Table 1a suggests that sixth-graders in Mauritius and Seychelles on average were about 11 years in age, much younger than the average of 15 years in Tanzania. The high values of average age in Tanzania reflected late entry into primary school, or repetition, or both, for large number of students, neither of which is conducive to high quality schooling. Other countries with the sixth-grade student population on average older than 14 years included Kenya, Lesotho, Malawi, Mozambique and Uganda. The high values of standard deviation of the average age in all of the countries except Mauritius and Seychelles suggest the large heterogeneity in student age in these school systems. Older students may outperform their younger peers simply because of their relative maturity. On the other hand, if a child is older than his classmates

because she or he repeated grades, older age in this case would be an indication of learning difficulty. Hence the direction of the relationship between child's age and reading scores is ambiguous. In all the school systems except in Mauritius, students attending rural schools on average were older than their urban counterparts, and the gap ranged from less than a month in Seychelles to about a year or more in Malawi, the mainland of Tanzania and Zambia.

The fourth column of Table 1a highlights the challenge that school systems in southern and western Africa faced in achieving gender parity in school participation, especially in Mozambique and Uganda where girls were at a disadvantage compared to boys in school access. On the other hand, in Lesotho, boys were at a relative disadvantage. It is noteworthy that in Mozambique, Uganda and Zambia, girls from rural areas were at a particular disadvantage in school access. The variable representing student sex was included because it has shown to be an important predictor of student's reading ability (Mullis, Martin, Gonzalez and Kennedy, 2003; UNESCO/UIS-OECD, 2003).

Rural areas in many less developed countries are associated with socioeconomic disadvantage, which seemed to be the case for countries participating in the SACMEQ study. The fifth column of Table 1a shows that, on average, students attending rural schools came from families with lower levels of SES in every school system. Table 1a also indicates that families of sixth-graders in Mauritius and Seychelles on average were much better off than those in other countries, especially those from Malawi, Mozambique, both the Mainland and Zanzibar of Tanzania and Uganda. While students' families in Mauritius and Seychelles were on average much better off, the gaps between the well-off and not so well-off were also much smaller in these countries than those in Botswana, Namibia and South Africa, as shown by the

standard deviations. It would be interesting to find out whether gaps in student's reading scores would be similar to their family SES across these countries.

When it comes to schooling, the sixth-graders in rural areas were more likely to have experienced grade repetition and had less academic support at home in terms of a family member discussing with them about their school work. The last two columns of Table 1a indicate that in eight out of the 14 school systems more than half of the sixth-graders had repeated a grade at least once. Such students made up two-thirds or more of the sixth-grade population in Malawi and Mozambique. Except in Mozambique and Seychelles, grade repetition was more prevalent among rural students in all the other countries.

Table 1b provides the summary statistics for the school-level variables used for this analysis. The SACMEQ study was designed to have a representative sample of sixth-grade students in each of the participating school system, not to have representative sample of schools. As such, these statistics should not and can not be used to draw any firm conclusions about the schools of the sixth-graders. Nevertheless, these summary statistics provide a rough indication of the school characteristics as well as the direction of gaps between rural and urban areas.

--- Insert Table 1b about here ---

Table 1b suggests that even though school systems varied in terms of the overall quality of the physical and human resources of their schools, rural schools tended to be at a disadvantage. For instance, while fewer than half of the sampled schools in Lesotho, Malawi, mainland Tanzania, Uganda and Zambia reported that their school buildings were in relatively good condition, in all countries rural schools were less likely to report so. In addition, rural schools overall had fewer facilities or equipment, and teachers in rural schools generally had access to fewer instructional

resources. In most of these countries, rural sixth-grade teachers seemed to lag behind their counterparts in urban schools in terms of their reading abilities. While the data suggest rural schools on average were disadvantaged in the quality of their physical and human resources, there was no clear pattern of rural-urban differences in terms of some of the major school processes.

In summary, a preliminary look at the data revealed that rural students not only lagged behind their urban counterparts in reading abilities, they also compared unfavourably in aspects of the conditions that are important to academic success. For instance, the SES levels of the families of rural students were in generally lower and the rural students tended to have less home support for their academic work. In addition, rural students tended to be older than their urban counterparts, either a result of late entry into the school system or higher incidence of grade repetition, or a combination of both. Even though many schools in the SACMEQ countries might benefit from a boost in physical and human resources, this was especially true for rural schools where more schools reported that their buildings needed major repairs, teachers had fewer instructional resources, there were in general fewer facilities and number of equipment and teachers had lower reading scores.

What accounts for rural-urban disparities in reading literacy scores?

Research questions 2 and 3 focused on the extent to which the differences in reading literacy scores between rural and urban students could be attributable to differences in individual and school characteristics. Table 2 presents the results from fitting a series of multilevel models to address these questions. To save space the table shows only the coefficients on the dichotomous variable representing that a school

was located in an urban community for each model that was fitted as was described in the previous section. These results are also displayed in Figure 1.

--- Insert Table 2 about here ---

--- Insert Figure 1 about here ---

The first column of Table 2 shows the rural disadvantage in reading literacy scores for each country by fitting the 'null' model to the data. These estimates are slightly different from the rural-urban differences shown in Table 1a because the former were adjusted for the design effects (Bryk and Raudenbush, 2002). As can be seen, students attending rural schools in Mauritius and Seychelles performed virtually as well as their counterparts in urban schools. However, sixth-graders attending schools in urban communities had an advantage of about 17 points in Malawi and Mozambique to more than 100 points in South Africa. The rural-urban gap was particularly striking in Kenya, Namibia, South Africa, Mainland Tanzania and Zambia where rural students lagged behind their urban counterparts in reading literacy scores by half a standard deviation or more.

Rural students, however, were subject to inferior home and school circumstances, as discussed above. The second column of Table 2 presents the estimated rural disadvantage in reading scores after adjusting for students SES, their age and sex. As expected, the size of the disadvantage was reduced in all school systems, and more than halved in Botswana, Malawi, Zambia and Zanzibar. The rural sixth-graders in Mauritius and Seychelles would even outperform their counterparts in urban schools, though the difference was not statistically significant. These results suggest that a large part of the relatively inferior performance in reading literacy test of the rural students was attributable to their home circumstances and their own characteristics.

The third column of Table 2 displays the estimated rural disadvantage in reading literacy scores after further taking into account the average SES levels of the schools, the condition of the school buildings, number of school facilities and equipment and the average reading scores of the teachers. These and the rest of the expanded multilevel models including school-level variables were not fitted to the data from Seychelles since the number of sampled schools, 24, was too few to obtain reliable parameter estimates for school-level variables. In addition, earlier analysis of the data indicates that rural-urban differences, when they existed, were much less pronounced in Seychelles than in most of the other SACMEQ school systems and thus might be less of a policy concern anyway. The results show that in all the rest of the 13 school systems except Mainland Tanzania and Zambia, the rural advantage virtually disappeared after further considering differences in school context and physical and human resources. Even in Mainland Tanzania and Zambia, the rural disadvantage was now reduced from 41 points to 24 and from 27 to 13 respectively. The average reading scores of the sixth-graders attending rural schools in South Africa and Uganda would be higher than that of their urban counterparts by 18 points, though these differences were statistically not different from zero.

The rest of the two columns present the estimated rural disadvantage in reading literacy scores after further controlling for the six variables representing school processes and two representing individual learning processes. As can be seen, the coefficients representing rural-urban differences in reading scores basically remained the same. This might be a result of lack of differences between rural and urban schools in the values of the process variables, as shown in Table 1a. In the case of the individual learning processes, which did exhibit differences in average values

for rural and urban schools, this might be a result of correlation between the two process variables and the other variables already included in the model.

In summary, the analysis demonstrated that in 12 out of the 14 school systems in southern and western Africa sixth-graders in rural areas underperformed their urban counterparts in reading literacy. A large part of this disadvantage, however, could be accounted for by differences in such individual characteristics as the family SES, age and sex. It is noteworthy that in all but two of the school systems, the disadvantage of rural students virtually disappeared after considering differences in these individual student characteristics, school context and resources between rural and urban areas.

Explaining away between- and within-school differences in students' reading literacy scores

Using data from SACMEQ II, Dolata, Ikeda and Marimba (2004) showed the enormous variations in the overall levels of quality and equality in reading literacy performance as well as the sources of the inequalities that in the 14 school systems in southern and western Africa. It remains a question to what extent the inequalities in reading scores were attributable to differences in student characteristics vis-à-vis school characteristics.

--- Insert Table 3 about here ---

Table 3 displays the results of the between- and within-school variances in reading literacy obtained from fitting the multilevel models, which addressed the above question. The first column reproduces the results from Dolata, Ikeda and Marimba (2004) and illustrates that overall gaps among students' reading abilities, as indicated by the total variance, differed substantially across the 14 school systems. The total variance in Mauritius, Seychelles and South Africa was twice or more than

that in Lesotho, Malawi, Mozambique, Swaziland and Zanzibar. School systems with overall large gaps between low-performing and high-performing students tended to have higher average scores. For instance, the average reading scores in Seychelles and Mauritius, two countries with the largest total variances, were higher than most of the other school systems. On the other hand, Lesotho and Malawi, two countries with smallest variances, were among countries with the lowest levels of average reading scores. There was, however, not a one-to-one relationship between average levels of reading scores and the total variances in the scores. For instance, the total variance in reading scores in South Africa was much larger than that in Botswana, Kenya, Mozambique, Swaziland and Mainland Tanzania, but its average reading score of South Africa, 492 points, was also much lower than that in these school systems.

Table 3 also shows that in half of the SACMEQ school systems, about one-third or more of the overall gaps in the reading scores existed between schools. These countries included Kenya (46 percent), Lesotho (40 percent), Namibia (63 percent), South Africa (67 percent), Swaziland (36 percent), Mainland Tanzania (32 percent) and Uganda (59 percent). It is noticeable that in South Africa, a country with quite large gaps among students' reading abilities, more than half of the total variance existed between schools. In Namibia and Uganda, two countries with about average levels of total variances among the 14 school systems, more than half of the gaps were at the school level.

The second column of Table 3 indicates that variables representing family SES, age, sex and urbanicity explained about half or more of the between-school variation in Botswana, Kenya, Namibia, South Africa, Mainland Tanzania and Zambia. These variables also explained part of the within-school variation in reading scores in the 14 school systems, though the proportion of such explained variance ranged from 2

percent in Uganda to 15 percent in Mauritius, much less than the reduction in the between-school component. The next column indicates that the between-school differences in reading scores could be further explained by differences in school contexts and resources. This was true in all the school systems except in Zanzibar. Putting together, differences in individual demographic characteristics and SES, school context and resources accounted more than half of the between-school variation in reading scores in Botswana, Kenya, Namibia, South Africa, Swaziland, Mainland Tanzania and Zambia.

The last two columns display the reduction in the between- and within-school variances in reading literacy scores after considering variables representing school processes as well as those representing individual learning processes. As can be seen, including school process variables led to further reduction in the between-school variances in eight out of the 13 school systems, though the size of the reduction was relatively small. Including the individual learning process variables also led to the reduction in the within-school variances in all the school systems. Compared to the proportions of between-school variances that were explained as a result of including the various individual and school variables, the proportions of explained within-school variances was fairly small. For instance, the explained variances of the between-school component ranged from about 14 percent in Zanzibar to 80 percent in South Africa. In seven school systems, this proportion was more than half of the total between-school variation. In contrast, only in four school systems did the explained variance made 10 percent or more of the within-school component.

There are at least two reasons that the reduction in the seemingly otherwise trivial proportions in the within-school variation warrants attention. In nine out of the 14 school systems in the study, the between-school component made up about one-

third or less of the total variation in students' reading scores. This means that the vast majority of the inequalities in students' reading abilities existed within individual schools in these systems. Hence the seemingly small proportion of reduction in the within-school variation was not be that small in absolute terms. Take Botswana, where the reduction was 73 percent of the between-school component and barely 16 percent of the within-school component. Considering the 26 percent of the total variation was at the school level and 74 percent at the student level, the two reductions constitute 20.3 percent and 11.9 percent of the total variation, respectively, neither of which is negligible. The second and a related reason is that including the individual process variables led to the noticeably further reduction in the within-school variation in students' reading scores. This occurred despite the fact that neither the school nor the individual process variables contributed to the rural-urban gaps as demonstrated earlier. Taken together these results suggest that differences in school processes might be at work in producing the observed differences in reading scores among schools. There is even stronger evidence that gaps in reading scores of students within schools were attributable to differences in how students approached learning, such as whether they repeated a grade or how frequent that family members were involved in the students' academic work.

To sum up, this part of the analysis demonstrated that the 14 school systems in southern and western Africa varied tremendously in how successful they achieved the goal of both raising the overall learning of all students and reducing the gaps between low-performing and high-performing students. It also showed that there was large variation in terms of the extent to which the inequities in students' reading scores existed between schools or within schools. More important, the analysis revealed that the context, physical and human resources and processes of schools as well as

individual approaches to learning were accountable for the sizeable proportions of between- and within-school inequalities in student learning outcomes.

Summary and Conclusion

This paper took a close look at the extent of disparities in the learning outcomes of primary school students in 14 school systems in southern and western Africa. It showed that these school systems faced enormous challenges in closing the gap in learning outcomes between rural and urban students, especially in countries where students in rural areas underperformed their urban counterparts by large margins. The paper also demonstrated that rural students on average also had lower levels of family SES and were older in age than their counterparts in urban areas. In addition, rural students were more likely to have repeated a school grade and they had less home support for their academic work. Even though there was no clear pattern of rural-urban differences in terms of school processes, rural schools had fewer and lower quality resources than urban schools. The school processes included how schools reading teachers assigned and corrected student homework, how frequently reading teachers met with students' parents to discuss the children's academic progress, as well as how frequently inspectors visited the teachers and to what extent the visiting inspectors provided positive and useful feedback to the teachers. The resources that were examined included the conditions of school buildings, the number of school facilities and equipment, the number of instructional resources available to reading teachers and the reading proficiency of the teachers.

More important, the analysis showed that the rural-urban gaps in reading literacy scores became substantially smaller after considering differences in student demographic characteristics. Such gaps virtually disappeared when differences in the

context and the physical and human resources of the schools were taken into consideration.

An additional major finding of the analysis is that students' demographic characteristics, including their family SES, as well as the school context and school resources were accountable for more than half of the differences in students' reading literacy scores among schools. The fact that students' reading scores depended upon their family SES in their countries, most of which are low-income countries, is different from the conclusions in Heyneman and Loxley (1983) and Baker, Goesling and Letendre (2002) which showed that school effects were more prominent in more developed school systems than in less developed systems. One explanation is that in a system where overall school enrolment rates are low, school quality is relatively more uniform. But with mass schooling, there is more differentiation in school quality. In addition, before schooling becomes universal, one would reap handsome social and economic returns by just graduating from a certain level of schooling, regardless of which school. In contrast, when schooling is with the reach of most or all of the population, parents, students and employers may exert pressure for schools to differentiate for purpose of selection for higher levels of schooling as well as screening for more able employees. Hence the observed relatively higher levels of differentiation along family SES lines in the more developed systems. Nevertheless, high levels of socio-economic differentiation are not an inevitable outcome of mass schooling. Nor should they be. Results from more industrialized countries suggest that it is ultimately a choice to be decided by individual systems how to prioritize quality and equity of student learning (UNESCO/UIS-OECD 2003).

Contrary to research elsewhere which concluded that the level and quality of school resources do not matter to students' learning outcomes, this analysis found that

indicators of school resources are important predictors of rural-urban gaps in students' reading literacy. To the extent that students from higher SES backgrounds are likely to attend better-resourced schools, the estimated effects of school resources on the reduction in rural-urban gaps might be conservative. From these results, one cannot definitively say that if rural schools will definitely have better performance if they are provided with more and higher quality physical and human resources. The fact that school processes accounted for additional between-school variances in addition to a host of individual and school factors suggests that as important as adequate resources are in ensuring that students have the necessary learning conditions, how teachers conduct their instruction and how education system provides the support for teachers to carry out their work is also important to enhance student learning.

The analysis also illustrated how students approached learning was responsible for part of the differences in their learning outcomes. Thus while highlighting the crucial role of school context and resources in reducing the rural-urban disparities in learning outcomes in southern and western Africa, the study suggests that improving school processes and strengthening home support for children's academic work are also indispensable to eliminating the inequities in students' learning outcomes both between and within schools. Indeed, raising the levels of learning outcomes for all students requires an integrated instead of piecemeal approach.

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Table 1a Means, standard deviations and rural-urban differences in means of variables representing student characteristics

country		Reading scores			Age in months			% girls		Index of students' SES			% repeaters		Index of home interest in student's academic work		
	n	Mean	Sd	Diff	Mean	Sd	Diff	%	Diff	Mean	Sd	Diff	%	Diff	Mean	Sd	Diff
Botswana	3,322	521.1	88.3	-36.7	157.8	13.7	4.5	51.0	-1.9	6.9	3.2	-2.4	31.4	4.2	10.8	2.2	-0.8
Kenya	3,299	546.5	88.9	-48.1	168.4	18.9	6.2	50.3	-2.6	6.1	2.6	-1.9	64.1	9.9	10.9	1.8	-0.7
Lesotho	3,155	451.2	57.9	-28.2	169.6	22.1	2.4	55.6	3.6	5.8	2.3	-1.3	60.8	2.9	10.5	2.1	-0.3
Malawi	2,333	428.9	49.9	-16.4	174.0	26.0	12.4	47.8	-4.9	5.2	2.6	-2.7	66.1	5.0	9.1	2.2	-0.6
Mauritius	2,945	536.4	121.6	-9.8	135.8	5.8	0.0	48.1	-0.4	10.6	1.8	-0.4	18.7	0.6	11.1	1.9	-0.1
Mozambique	3,177	516.7	64.7	-18.5	176.7	22.9	8.3	40.3	-12.8	5.4	2.8	-1.7	78.2	-8.2	10.9	1.9	-0.1
Namibia	5,048	448.8	86.6	-85.4	166.4	22.4	10.9	51.9	1.4	6.3	3.3	-3.8	54.1	11.8	11.0	2.2	-0.6
Seychelles	1,484	582.0	124.2	-7.0	138.8	4.8	0.4	50.1	-3.0	11.0	1.8	-0.3	10.3	-2.4	11.2	1.9	-0.6
South Africa	3,163	492.3	122.4	-118.7	156.9	19.1	6.7	52.5	-0.4	8.5	3.4	-3.6	42.3	19.6	11.1	2.1	-0.6
Swaziland	3,139	529.6	68.2	-40.1	166.4	19.8	6.9	51.6	0.0	7.5	2.9	-2.9	59.3	12.1	10.2	2.0	-0.5
Mainland Tanzania	2,854	545.9	90.1	-72.8	180.4	18.0	11.8	52.2	0.2	5.2	2.5	-3.1	23.3	5.5	11.5	2.7	-1.3
Uganda	2,642	482.4	91.2	-36.4	171.4	22.0	5.3	44.5	-7.7	4.9	2.4	-1.4	52.9	2.2	10.5	2.2	-0.7
Zambia	2,611	440.1	84.7	-57.0	166.7	20.4	15.3	48.4	-8.5	6.3	2.9	-2.7	51.5	15.5	10.4	2.1	-0.6
Zanzibar Tanzania	2,514	478.2	70.4	-23.9	179.1	19.0	7.1	51.7	-1.7	5.5	2.9	-3.2	27.6	6.4	9.7	1.9	-0.6
Total		496.8	97.9	-50.5	165.5	22.9	9.9	49.9	-1.1	6.7	3.3	-2.7	47.6	8.3	10.7	2.2	-0.6

Table 1b Means and rural-urban differences in means of variables representing school characteristics (to be continued)

country		School mean of students' SES		School building in relatively good condition		Index of school material resources		Index of reading instructional resources		Average reading scores of teachers	
	n	Mean	Diff	Mean	Diff	Mean	Diff	Mean	Diff	Mean	Diff
Botswana	170	7.0	-2.7	0.61	-0.02	9.8	-2.4	11.0	-0.6	758.1	-7.9
Kenya	185	6.3	-1.9	0.67	-0.17	7.9	-2.7	8.5	-1.0	791.5	0.2
Lesotho	177	5.6	-1.4	0.33	-0.14	6.3	-1.9	10.3	-0.1	724.0	-13.2
Malawi	140	5.1	-2.7	0.41	-0.03	4.2	-1.5	7.3	-0.3	712.0	-10.9
Mauritius	153	10.5	-0.5	0.83	-0.03	14.5	-0.6	9.4	0.4	--	--
Mozambique	176	5.1	-1.7	0.55	-0.03	6.7	-2.3	6.3	-0.4	716.3	-4.9
Namibia	270	6.8	-3.8	0.54	-0.20	10.9	-7.9	8.9	-1.7	730.5	-59.4
Seychelles	24	11.0	-0.4	0.63	-0.03	16.6	0.5	12.2	0.0	820.0	-4.4
South Africa	169	8.4	-3.2	0.54	-0.38	11.6	-9.1	9.5	-1.5	--	--
Swaziland	168	7.4	-2.7	0.51	-0.14	8.4	-3.6	10.0	-1.1	747.8	-0.4
Mainland Tanzania	181	4.9	-2.6	0.47	-0.10	5.3	-1.2	7.0	0.5	705.5	-9.1
Uganda	163	5.0	-1.5	0.26	-0.31	7.4	-3.4	7.8	-1.3	701.2	-26.2
Zambia	173	6.0	-2.8	0.49	-0.32	6.2	-3.7	8.2	-0.1	761.6	2.8
Zanzibar Tanzania	145	5.0	-3.3	0.55	-0.04	5.8	-2.2	6.1	-0.3	649.4	-12.0
Total		6.4	-2.6	0.52	-0.18	8.3	-4.1	8.6	-0.7	730.2	-22.9

Table 1b Means and rural-urban differences in means of variables representing school characteristics (continued)

country	Teacher assigns and corrects reading homework		Teacher frequently meets with parents to discuss student's progress		Index of positive feedback by visiting inspectors		Number of visits by inspectors 1998-2000		Index of problems of student behaviour		Index of problems of teacher behaviour	
	Mean	Diff	Mean	Diff	Mean	Diff	Mean	Diff	Mean	Diff	Mean	Diff
Botswana	0.80	-0.01	0.81	-0.16	6.46	0.60	2.27	0.09	2.72	0.00	3.55	0.06
Kenya	0.94	-0.02	0.89	-0.05	6.77	0.99	6.94	0.29	1.49	-0.53	3.64	-0.08
Lesotho	0.90	0.02	0.79	-0.02	5.40	0.94	4.31	1.25	2.36	0.15	3.75	-0.19
Malawi	0.70	-0.02	0.89	0.07	5.33	0.32	4.49	-0.03	2.36	1.07	4.13	-0.13
Mauritius	0.91	0.08	0.74	0.11	5.41	1.13	--	--	1.25	-0.10	2.69	0.00
Mozambique	0.88	-0.01	0.87	-0.01	4.73	0.63	3.47	-0.09	1.36	0.10	4.20	-0.36
Namibia	0.85	-0.02	0.68	-0.11	3.13	1.85	0.06	-0.02	2.21	0.08	3.79	0.21
Seychelles	0.83	-0.06	0.97	0.04	--	--	--	--	2.00	-1.52	3.79	-1.25
South Africa	0.79	0.03	0.80	-0.19	2.69	0.19	1.84	0.53	2.62	0.71	3.84	0.50
Swaziland	0.83	0.00	0.65	-0.02	2.40	-0.72	--	--	2.95	-0.75	3.86	-0.52
Mainland Tanzania	0.75	-0.06	0.73	0.18	7.33	0.34	3.62	-0.98	4.83	-0.38	4.15	-0.05
Uganda	0.79	0.04	0.79	0.00	6.49	-0.12	5.88	0.54	4.63	1.17	4.88	0.81
Zambia	0.62	-0.05	0.83	-0.11	5.38	-0.93	2.37	-0.75	2.67	0.72	4.49	-0.46
Zanzibar Tanzania	0.72	-0.03	0.69	-0.18	5.74	-1.05	5.03	-0.31	1.85	0.04	3.81	-0.32
Total	0.81	-0.02	0.78	-0.06	5.09	0.64	3.44	0.46	2.56	0.47	3.90	0.03

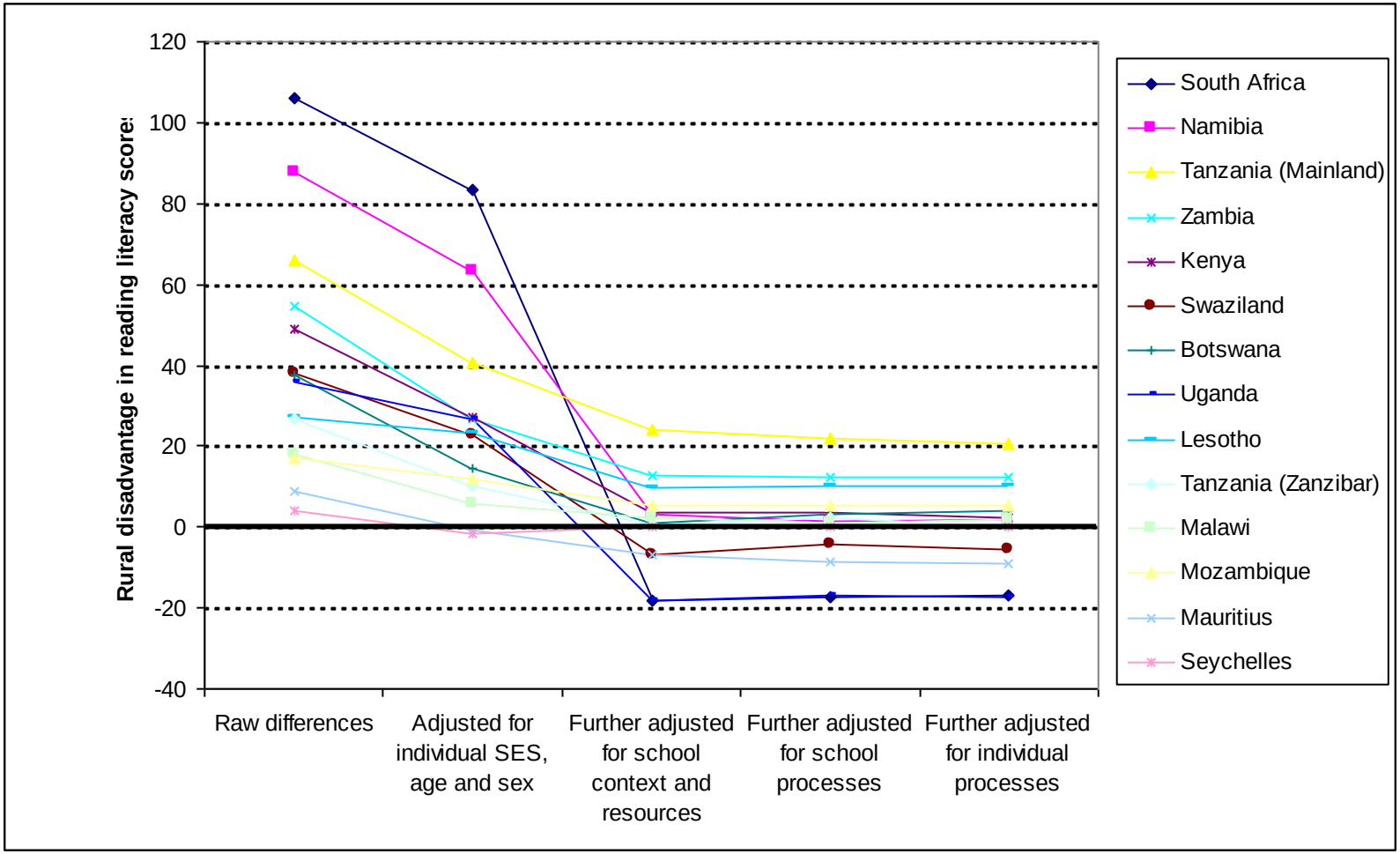
Table 2 Urban advantages in reading achievement

			Adjusted for individual SES, age and sex		Further adjusted for school context and resources		Further adjusted for school processes		Further adjusted for individual processes	
Country	Raw differences	SE	Difference	SE	Difference	SE	Difference	SE	Difference	SE
Botswana	37.72	(6.78)	14.53	(4.91)	0.90	(5.53)	3.22	(5.46)	4.16	(5.44)
Kenya	49.15	(9.00)	27.18	(7.80)	3.68	(7.76)	3.62	(7.59)	2.34	(7.65)
Lesotho	26.97	(6.34)	23.43	(5.92)	9.57	(6.50)	9.93	(6.34)	9.93	(6.28)
Malawi	17.93	(5.59)	5.59	(5.25)	2.48	(6.16)	0.86	(6.21)	1.65	(6.21)
Mauritius	8.82	(10.78)	-0.96	(8.70)	-6.97	(9.32)	-8.52	(9.85)	-9.16	(9.61)
Mozambique	17.20	(6.69)	11.67	(6.68)	5.28	(7.14)	5.42	(7.46)	5.37	(7.45)
Namibia	87.53	(8.11)	63.19	(6.18)	3.31	(6.51)	1.45	(6.51)	1.75	(6.39)
Seychelles	4.05	(14.64)	-1.54	(12.22)	--	--	--	--		
South Africa	106.11	(11.9)	83.58	(10.24)	-18.14	(12.07)	-17.46	(11.42)	-16.99	(11.30)
Swaziland	38.03	(7.78)	22.78	(6.43)	-6.95	(7.14)	-4.34	(6.89)	-5.40	(6.94)
Mainland Tanzania	66.14	(6.75)	40.73	(6.73)	24.21	(6.33)	21.99	(6.81)	20.54	(6.89)
Uganda	35.96	(13.68)	26.72	(12.89)	-18.01	(11.94)	-16.86	(11.13)	-17.50	(11.01)
Zambia	54.44	(6.86)	26.50	(5.44)	12.65	(5.97)	12.15	(6.18)	12.49	(6.20)
Zanzibar Tanzania	26.52	(6.13)	10.01	(6.66)	0.60	(8.52)	2.38	(9.19)	0.06	(9.04)

Table 3 Decomposition of variances in reading literacy scores

Country	Null model			Reduction in variance after adding the following variables							
				Individual SES, sex, age and urbanity		Further including **school context and resources**		Further including **school processes**		Further including **individual processes**	
	Total variance	Between-school	Between as % of total	Between	Within	Between	Within	Between	Within	Between	Within
Botswana	7,844	2,053	26.18	57.3	11.0	71.70	11.13	72.73	11.17	72.53	16.16
Kenya	8,020	3,701	46.14	44.6	10.4	55.90	10.47	59.06	10.42	58.28	11.16
Lesotho	3,446	1,381	40.08	19.0	5.0	31.65	5.13	33.46	5.13	35.20	6.83
Malawi	2,494	714	28.62	18.7	6.1	23.92	6.10	29.24	6.10	29.10	7.62
Mauritius	14,733	3,742	25.40	35.5	15.4	39.23	15.43	43.94	15.44	45.38	17.12
Mozambique	4,260	1,310	30.75	11.4	4.1	18.83	4.16	16.69	4.16	16.77	4.23
Namibia	8,047	5,029	62.50	59.0	5.0	78.01	5.06	76.95	5.06	79.72	8.21
Seychelles	15,783	1,510	9.57	34.2	12.6	--	--	--	--	--	--
South Africa	13,739	9,179	66.81	48.8	7.8	73.06	7.85	76.33	7.85	77.13	9.03
Swaziland	4,567	1,623	35.54	38.5	7.5	52.32	7.62	52.44	7.65	52.38	10.20
Mainland Tanzania	7,838	2,483	31.68	47.2	5.5	50.47	5.53	53.21	5.55	54.49	7.70
Uganda	8,740	5,159	59.03	18.3	1.9	39.50	2.01	40.35	2.01	40.33	4.22
Zambia	6,977	2,074	29.73	60.4	5.9	62.49	5.64	61.19	5.62	62.11	8.88
Zanzibar Tanzania	4,975	1,238	24.89	16.7	3.9	14.62	3.90	11.64	3.90	13.41	6.96

Figure 1 What accounts for rural disadvantage in reading literacy scores?



Appendix A Basic economic and educational indicators of sub-Saharan African countries

Countries	Primary education					Secondary education		Public expenditure on education as % of GNP
	NER (%) Total	GPI in GER	Survival rate Grade 5 (%)	% of trained teachers	Pupil/teacher ratio	GER (%) Total	GPI	
Angola	...	...	...	...	...	19.1	0.78	3.4
Benin	...	0.70	68.3	...	53	26.0	0.46	3.3
Botswana	80.9	1.00	87.6	89.5	27	72.7	1.06	*2.3*
Burkina Faso	35.0	0.71	77.8	...	47	10.2	0.65	...
Burundi	53.4	0.79	67.5	...	49	11.1	0.73	3.9
Cameroon	...	0.86	63.7	...	61	32.6	0.82	3.9
Cape Verde	100.6	0.96	88.0	67.2	29	68.7	1.05	...
Central African Republic	...	0.67	...	...	...	...	...	...
Chad	62.8	0.64	44.3	...	68	14.5	0.33	...
Comoros	...	0.82	...	...	39	27.7	0.84	3.7
Congo	...	0.93	66.3	...	56	32.0	0.71	4.6
Côte d'Ivoire	62.6	0.74	...	...	44	...	...	4.8
Democratic Rep. of the Congo	...	...	...	...	...	...	...	...
Equatorial Guinea	84.6	0.91	*29.5*	...	...	29.7	0.57	2.2
Eritrea	42.5	0.81	86.3	72.6	44	27.6	0.65	3.8
Ethiopia	46.2	0.71	58.7	69.3	64	19.0	0.62	4.6
Gabon	...	0.99	69.3	...	43	50.9	...	*4.6*
Gambia	78.7	0.98	...	*73.1*	38	34.2	0.71	...
Ghana	60.2	0.91	63.3	64.9	32	37.6	0.82	...
Guinea	61.5	0.75	79.7	...	47	...	...	*1.9*
Guinea-Bissau	...	*0.67*	...	...	*44*	*17.8*	*0.54*	...
Kenya	69.9	0.98	59.0	...	34	32.0	0.90	7.3
Lesotho	84.4	1.02	73.0	74.8	47	33.6	1.27	8.4
Liberia	...	...	...	...	...	...	...	...
Madagascar	68.6	0.96	52.9	...	47	...	...	2.9
Malawi	...	0.96	43.8	*51.2*	62	34.0	0.76	...
Mali	44.5	0.75	74.6	...	56	...	...	...
Mauritius	93.2	1.00	98.9	100.0	25	78.8	0.98	3.3
Mozambique	59.7	0.79	49.2	59.9	66	13.3	0.66	...

Namibia	78.2	1.01	94.7	87.1	32	61.4	1.14	7.5
Niger	34.2	0.68	69.1	...	41	6.5	0.65	2.4
Nigeria	...	0.81	...	...	40	...	...	...
Rwanda	84.0	0.99	46.6	81.2	59	14.4	0.88	*2.8*
Sao Tome and Principe	98.5	0.94	*61.5*	...	33	39.2	0.84	...
Senegal	57.9	0.91	80.0	90.5	49	18.7	0.67	3.6
Seychelles	101.7	0.99	100.2	77.7	13	110.0	1.05	...
Sierra Leone	...	*0.70*	...	*78.9*	*37*	*26.4*	*0.70*	*3.8*
Somalia	...	...	...	...	...	...	...	...
South Africa	89.5	0.96	...	67.6	37	86.4	1.09	5.6
Swaziland	76.7	0.95	73.2	...	33	45.2	1.00	5.2
Togo	94.8	0.82	68.6	80.5	35	...	...	...
Uganda	...	0.96	63.6	...	54	16.8	0.77	...
United Rep. of Tanzania	54.4	0.98	101.8	100.0	47	...	...	...
Zambia	66.0	0.94	98.5	...	45	24.1	0.80	2.1
Zimbabwe	82.7	0.97	...	95.3	38	42.9	0.89	*4.9*
Sub-Saharan Africa	62.8	0.86	66.6	...	44	26.8	0.79	3.4
Developing countries	82.5	0.92	83.3	...	28	56.6	0.89	4.2
World	84.0	0.93	...	...	22	63.7	0.92	4.5

Note: Countries in bold are SAQMEQ countries; Data in italics are for 2000