# Gender Differences in School Effects on Learning and Enrolment Outcomes in Rural Malawi

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## Abstract

This paper uses data from the 2007 and 2008 rounds of the Malawi Schooling and Adolescent Survey (MSAS) to investigate school-level factors that differentially affect the learning and enrollment outcomes for male and female students. Preliminary analyses show that although female students are significantly more likely than male students to leave school between survey rounds, they are also more likely than males to be literate in English or Chichewa. We find that school level factors make a negligible contribution to the overall variance in school re-enrollment. However, school-level variance accounts for a larger share of the overall variance in math performance, grade repetition, and absenteeism for female relative to male students. This suggests that even though there is no significant difference by sex in the average math score and absenteeism, the association between the sex of the respondent and these outcomes may not be constant across school contexts.

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## Introduction

Over the past twenty years, the gender gap in schooling attainment has narrowed across most regions of the less developed world (Grant and Behrman 2010; Hewett and Lloyd 2005; Lloyd and Hewett 2009). Conditional on ever enrolling in school, girls now complete at least as many years of schooling on average, as boys(Grant and Behrman 2010). However, this trend disguises potential gender inequalities in schooling experience and actual learning outcomes. This paper uses data from the Malawi Schooling and Adolescent Survey (MSAS) to investigate school-level factors that differentially affect the learning and enrollment outcomes for male and female students.

The earliest studies of school effects in less developed countries concluded that school level characteristics were more important relative to family characteristics in poor countries than had been observed in industrialized countries, such as the United States (Heyneman 1976). This pattern was attributed to the belief that there was greater variance in the physical facilities of schools in poor countries than there was variance in social class. Subsequent research in less developed countries found that basic material inputs had a larger impact on learning outcomes than other more expensive inputs, due to the extreme inequality in school facilities found in these settings (Buchmann and Hannum 2001). However, the introduction of multi-level regression models that allowed researchers to parse out the relative contribution of school- and family-level characteristics to the overall variance in schooling outcomes found that family and individual effects were substantively larger than school effects, even in poor countries (e.g. Lockheed and Longford 1991).

More recent studies have focused on how school environments may exacerbate inequality within schools. A series of studies in Kenya found that in schools with gender-biased classroom environments, female students were both more likely to drop out of school prematurely (Lloyd

et al. 2000) and more likely to initiate sexual activity at a younger age (Mensch et al. 2001). These differences were attributed to teachers' biased expectations about female academic performance, the harassment of female students by their male classmates, and the overall lack of support for female students. A more recent multi-level study from Botswana highlighted how teacher characteristics widened socio-economic achievement gaps within schools by reproducing the social inequalities found in the local community (Zuze 2010); it is plausible that local gender inequalities could be reproduced in a similar fashion, although this association was not examined by that study.

Although the government of Malawi introduced universal free primary schooling in 1994, there is widespread evidence that investments in school quality did not keep pace with the increased enrollments that followed this policy (Kendall 2007). Almost all children in Malawi now spend at least a few years in school, and the gender gap in schooling attainment has closed in most parts of the country (Grant 2008). Nonetheless, a significant female disadvantage is still present in the southern districts of Malawi. In this paper, we will use data on school facilities, teacher characteristics, and enrollment patterns from the 2007 and 2008 survey rounds of the Malawi Schooling and Adolescent Survey to examine gender differences in learning and enrollment outcomes in two districts of Malawi.

**Data and Methods**

The Malawi Schooling and Adolescent Study (MSAS) is a longitudinal, school-based survey that began interviewing a cohort of 14-16 year olds in 2007. The original sample consisted of 1,764 primary school students who were randomly chosen from the enrollment rosters of 59 primary schools in two adjacent districts in southern Malawi. The probability of a particular school being included was proportional to its enrollment in 2006. At each school approximately 30 students stratified by gender and age who were enrolled in standards 4-8, the last four years of primary school, were interviewed. An additional 886 14-16 year olds who were no longer enrolled in school (but who lived in the communities from which the primary schools drew their students) were identified by key informants. Respondents have been re-interviewed annually since 2007; the most recent survey round was collected in June-August 2010, when the respondents were 17-19 years old, and successfully re-interviewed 87 percent of the original sample. However, this analysis is restricted to the original sample of students and uses data from the 2007 and 2008 survey rounds to examine learning and enrolment outcomes for these respondents.

The main survey of the MSAS collected individual-level data on household living arrangements and socio-economic status, schooling history and school experiences, work history, and detailed information about relationships and sexual experience. Sensitive portions of the survey, including questions about students' sexual experience, harassment or abuse by teachers and fellow classmates at school, and substance abuse were asked using an audio-computer assisted survey instrument (ACASI); all other modules of the survey were collected using a face to face interview format. In addition to the main survey, all respondents were given a brief test of their literacy and math skills. School-level information was collected from each of the 59 sampled primary schools. At each survey round from 2007-2009, an inventory of school facilities was taken. In 2007, all teachers for standards 4-8 were interviewed about their training, teaching responsibilities, socio-demographic characteristics, and gender attitudes about student academic performance. These data provide a range of school-level characteristics that may affect student outcomes.

This analysis will focus on a set of six learning and enrollment outcomes: math skills, English literacy, Chichewa literacy, school absenteeism, grade repetition, and continued school enrollment. The learning outcomes and school absenteeism were measured in 2007, and grade repetition and continued school enrollment are based on the respondents' schooling status one year later in 2008. Given the structure of the data, we will use multi-level regression models to appropriately control for the contribution of school-level characteristics to the overall variance in these outcomes.

**Preliminary Findings**

Table 1 shows the distribution of the learning and enrollment outcomes for male and female students in our sample. These differences are statistically significant ($p<0.05$) for all outcomes, except the math score and absenteeism. As other data from Malawi suggest, there is a large gender difference in the percentage of students who re-enrolled in school the following year: 89 percent of male students remained enrolled in school, as compared to 75 percent of female students. In contrast, there appears to be a small female *advantage* in other learning outcomes. An additional four percent more females than males are able to read two sentences in Chichewa without difficulty, and an additional seven percent more females than males are literate in English. Furthermore, male students were slightly more likely than female students to be repeating the same grade one year later.

In contrast, Table 2 shows the proportion of the overall variance in each of these outcomes that is explained by the school-level variance. Notably, school level factors make a negligible contribution to the overall variance in school re-enrollment: in other words school dropout is unrelated to school characterstics and can be attributed to individual level factors and random error. School-level variance makes a greater contribution to the literacy outcomes of male students than to female students, although the differences are not large. More important are the substantially larger contributions of school factors to female math performance, grade repetition, and absenteeism. This suggests that even though there is no significant difference in the average math score and absenteeism, the association between the sex of the respondent and these outcomes may not be constant across school contexts.

**References**


Buchmann, Claudia and Emily Hannum. 2001. Education and Stratification in Developing Countries: A Review of Theories and Research. *Annual Review of Sociology*. 27: 77-102.

Grant, Monica J. 2008. Children's school participation and HIV/AIDS in rural Malawi: The role of parental knowledge and perceptions. *Demographic Research. 19(45): 1603-1634.*

Grant, Monica J. and Jere R. Behrman. 2010. Gender Gaps in Educational Attainment in Less Developed Countries. *Population and Development Review*. 36(1): 71-89.

Hewett, Paul C. and Cynthia B. Lloyd. 2005. Progress Toward Education for All: Trends and Current Challenges for sub-Saharan Africa. In: *The changing transitions to adulthood in developing countries: selected studies.* Pp. 84-118. Washington D.C.: National Research Council/Institute of Medicine.

Heyneman, Stephen P. 1976. Influences on Academic Achievement: A Comparison of Results from Uganda and More Industrialized Societies. *Sociology of Education.* 49(3): 200-211.

Kendall, Nancy. 2007. Education for All Meets Political Democratization: Free Primary Education and the Neoliberalization of the Malawian School and State. *Comparative Education Review*. 51(3): 281-305.

Lloyd, Cynthia B., Barbara S. Mensch and Wesley H. Clark. 2000. The effects of primary school

quality on school dropout among Kenyan girls and boys. *Comparative Education Review*. 44(2): 113-147.

Lloyd, Cynthia B. and Paul C. Hewett. 2009. Educational inequalities in the midst of persistant poverty: Diversity across sub-Saharan Africa in educational outcomes. *Journal of International Development*. 21(8): 1137-1151.

Lockheed, M.E. and N.T. Longford. 1991. School effects on mathematics achievement gain in Thailand. *Schools, classrooms, and pupils: International studies of schooling from a multi-level perspective*. Eds. Stephen Raudenbush and J.D. Willms. Pp. 131-148.

Mensch, Barbara S., Wesley H. Clark, Cynthia B. Lloyd, and Annabel S. Erulkar. 2001. Premarital Sex, Schoolgirl Pregnancy, and School Quality in Rural Kenya. *Studies in Family Planning*. 32(4): 285-301.

Zuze, Tia Linda. 2010. Human Resource Inputs and Educational Outcomes in Botswana's Schools: Evidence from SACMEQ and TIMMS. Stellenbosch Economic Working Papers: 16/10.

Table 1. Distribution of selected learning and enrollment outcomes, students, 2007-2008 Malawi Schooling and Adolescent Survey

| Outcome variables | All | Male | Female |
|---|---|---|---|
| Can read English | 70.1 | 66.7 | 73.6 |
| Can read Chichewa | 90.6 | 88.7 | 92.7 |
| Math score (percent correct) | 79.6 | 79.3 | 80 |
| Re-enroll at round 2 | 82.3 | 89.3 | 74.6 |
| Grade repetition by round 2 | 13.8 | 15.3 | 12.1 |
| Absent on last school day | 20.3 | 20.6 | 20.1 |

Table 2. Proportion of overall variance explained by school-level variance, students, 2007-2008 Malawi Schooling and Adolescent Survey

| Outcome variables | All students | Male | Female |
|---|---|---|---|
| Can read English | 0.0732 | 0.1521 | 0.1347 |
| Can read Chichewa | 0.0437 | 0.1112 | 0.1041 |
| Math score (total correct) | 0.0489 | 0.0469 | 0.1450 |
| Dropout by round 2 | 0.0000 | 0.0058 | 0.0000 |
| Grade repetition by round 2 | 0.0702 | 0.0267 | 0.1384 |
| Absent on last school day | 0.1320 | 0.0978 | 0.1634 |