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Reading and numeracy skills after school leaving in southern Malawi: A longitudinal analysis

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ABSTRACT

The extent to which skills acquired during schooling are retained after school-leaving in developing countries remains largely unknown. Using a longitudinal dataset of Malawian adolescents aged 14–17 attending school when first interviewed in 2007, we investigate whether literacy and numeracy skills at school leaving were retained several years after. We find a significant gender difference in skill level after school leaving for English skills, even after controlling for initial skill level and grade attainment, with females scoring lower than males. Although the gender difference in numeracy is not significant, females score lower than males after school leaving.

1. Introduction

Over the past two decades considerable attention has been placed, and progress made, on increasing access to schooling and narrowing the gender gap in primary school enrollment in developing countries (Lloyd and Hewett, 2009). More recently, focus has been shifting from expanding access to improving learning outcomes, particularly given concerns about school quality in many poor settings (UNESCO, 2005, 2006; van der Gaag and Adams, 2010; Perlman Robinson, 2011). Even if the gender difference in educational attainment closes, a gap in skill retention may persist if young men and women leave school with different skill levels or experience different opportunities to exercise those skills outside of school. Although the low levels of learning among students in developing countries have been widely documented (Hungi et al., 2010; Pritchett, 2013; Spaull and Taylor, 2015), very few studies have looked at the skills of young people who are out of school (Glick and Sahn, 2009; Asadullah and Chaudhury, 2015), and even fewer have compared skills before and after school leaving (Wagner et al., 1989). Thus, the extent to which young people retain skills that they had at school-leaving remains largely unknown.

If young women, in particular, are unable to retain the literacy and numeracy skills gained in school, then the beneficial demographic and health outcomes that are predicted to accompany expanded schooling attainment may be compromised. Literacy has emerged as an important dimension of the mechanisms linking female education to maternal and child health. Based on data from Mexico, Zambia, Venezuela, and Nepal, LeVine et al. (2012: p.148) theorize that literacy skills acquired in school enable mothers to engage in 'pedagogical mothering,' described as responding to infants' vocalizations by looking at and talking to them (p.132), as well as successfully navigate the healthcare system. The authors argue that these are key elements explaining the association between women's schooling and child health and school performance. Recent work by Smith-Greenaway (2013) found that the association between mother's educational attainment and child mortality in Nigeria was fully explained by reading skills. Analyzing data from Morocco, Glewwe (1999) found that a mother's knowledge obtained outside of school, using literacy and numeracy skills learned in the classroom, played a more important role in improving child health than did information taught in class, or simply exposure to formal schooling.

Data from developing countries suggest that math, science, and reading skills – as distinct from years of schooling – also yield strong economic returns, both at the individual level and as a driver of growth (Hanushek and Woessman, 2008). In addition, adult literacy, particularly for females, has been linked to increased political engagement (Burchfield et al., 2002) and greater likelihood of sending children to school (Abadzi, 2003). Although literacy and numeracy skills can be developed outside the classroom, formal education represents the primary means for acquiring such skills. It is important to ensure,

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particularly in view of the resources devoted to supporting global education systems, that students acquire foundational skills while in school, and are able to retain those skills upon school leaving.

In this paper we investigate reading and numeracy skills after school leaving, while taking into account skills at school leaving, using data from the Malawi Schooling and Adolescent Study (MSAS), a longitudinal survey of young people in southern Malawi. The paper is structured as follows: first, we review the literature relevant to the present study, summarize pertinent characteristics of the local context, present our conceptual framework and describe the data and methods used to investigative our research questions. We then present the results and conclude by discussing our findings, the limitations of our study, and directions for future research.

2. Background

2.1. Literacy, numeracy, and skill loss

A minimum level of literacy and numeracy skills is likely needed for utilization and retention of those skills, as well as building other important cognitive skills, throughout life. Chall et al. (1990), who conceptualized literacy acquisition in U.S. students as a multi-stage process, argued that students who failed to transition from "learning to read" to "reading to learn" while in school were more likely to lose their literacy skills after leaving school than students who had successfully made that transition. They called this transition point the "fourth grade slump," and demonstrated that at-risk readers (including those whose home environments did not support literacy development) faced particular challenges during this juncture. Building on this work, Wagner (1994: p.14) noted that "it is sometimes claimed for developing countries that at least four to six years of primary school is the intellectual human resources floor upon which national economic growth is built." The activities in which young people engage after leaving school—whether employment, household work, or childbearing—may result in erosion, preservation, or strengthening of the skills learned in school. Knowing who is at risk of losing basic skills could help focus remedial literacy programs for students and those who recently left school, as well as improve the quality of instruction for children still in school.

Ideally, the study of skill loss requires longitudinal data, through which the capabilities of the same individuals can be followed over time (Wagner et al., 1989; Glewwe, 2000). With few exceptions, due to a limited number of longitudinal datasets, the retention of skills among school leavers has largely been overlooked in the empirical literature. Indeed, LeVine et al. (2012), who analyzed cross-sectional literacy assessments for mothers, assumed that adult literacy reflected retention of skills acquired in school, despite the fact that assessments were conducted an average of fifteen years after mothers had left school. Their argument may be plausible for those interviewed between 1983 and 1998 (the dates of their study), when school participation was far from universal (Grant and Behrman, 2010; Lloyd and Hewett, 2009; Bruns et al., 2003) and those who attended were likely more selective.[1] Moreover, schools may not have been as overcrowded as they currently are in much of sub-Saharan Africa and thus students may have had stronger skills upon leaving school. LeVine and colleagues also assumed that, at school leaving, mothers were performing at grade level on average, and attributed poorer than expected performance in reading comprehension to skill loss after school leaving, rather than failure to acquire those skills while in school. However, given the rapid influx of students into schools in recent decades, and the subsequent deterioration in school quality in many countries (Kendall, 2007), the assumption that students retain skills gained in school into adulthood—or attained mastery of the appropriate skill while in school—is increasingly unfounded.

A few researchers have used longitudinal data to examine skill retention, such as Wagner et al. (1989), who investigated whether 72 fifth grade school leavers in Morocco retained basic skills. They found that two years after leaving school these adolescents demonstrated a significant increase in performance in Arabic literacy (first language), modest gains in French literacy (second language), no change in cognitive skills, and a decrement in math skills. They also found that the literacy of urban leavers improved more than for rural leavers, and that girls retained more academic skills than boys even though they were less likely to be employed. Ethnographic interviews and observations in the home revealed that, compared to their male counterparts, adolescent females who were relatively secluded were also more likely to read books, apparently as a way to have access to the world beyond their homes.

Hartley and Swanson (1986) traced the skill trajectories of primary students and dropouts in Egypt over a two-year period and observed that school leavers from early grades, who had lower skills than their peers before leaving school, continued to acquire skills after dropout, but at a considerably slower rate than their peers who remained in school. However, school leavers from later grades experienced an erosion of both literacy and numeracy skills after school leaving, suggesting a possible convergence of skills for these groups, albeit below functional standards (Hartley and Swanson, 1986).

Using data from the INCAP study in Guatemala, Gorman and Pollitt (1997) found that students' reading skills improved steadily until grade three, at which point all students were literate based on the study assessments. After leaving school, subjects' reading skills continued to improve, with the largest improvements among those who had completed fewer (1–3) years of schooling, although reading performance remained highest among those with the most years of schooling (5–6), regardless of how long they had been out of school (Gorman and Pollitt, 1997).

Evaluation of adult literacy programs provides further empirical evidence of skill attrition. In a World Bank review of the program implementation experience, Abadzi (2003) noted that, although data were somewhat sparse due to deficient monitoring and the difficulties of tracing course graduates, evidence from programs in India, Bangladesh, and Ghana suggested that a considerable proportion of beneficiaries of adult literacy programs subsequently relapsed into illiteracy. Durgunoğlu et al. (2003) found that, relative to a comparison group, initial literacy gains among 60 participants in a 90-hour adult literacy program in Turkey disappeared six months after course completion. The authors cited two factors associated with skill attrition: low proficiency levels at the start of the program, and limited use of literacy skills after the course concluded.

Researchers conducting a randomized controlled trial in Niger similarly found that extracurricular utilization of literacy skills enhanced retention (Aker et al., 2011). The RCT, implemented in 117 villages, compared literacy acquisition and retention among men and women enrolled in a classroom-based adult literacy program with those of participants exposed to the same basic program with an additional mobile phone component. The study showed that, although literacy and numeracy skills improved in both groups, average test scores were 20 percent higher for writing and 11 percent higher for math in the villages with the mobile phone component, compared to the basic program alone. Moreover, seven months after the intervention attrition of skills was lower in the villages with the added mobile phone component, which the authors attributed to mobile phone usage outside the classroom. The researchers also observed a gender difference in test

[1] LeVine et. al argued that selectivity was unlikely to explain their findings given historical and anthropological data indicating that, during the period when study respondents were school-aged, parents' decisions about their children's schooling were unrelated to student ability or level of achievement. However, they apparently did not consider that those who entered school might have been selective to begin with. For example, coming from a family with a higher socioeconomic status might not only increase the chances of entering or remaining enrolled in school, but it may also increase exposure to opportunities to exercise and maintain reading and numeracy skills outside of school.