



# DEMOGRAPHIC RESEARCH

*A peer-reviewed, open-access journal of population sciences*

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## ***DEMOGRAPHIC RESEARCH***

**VOLUME 33, ARTICLE 35, PAGES 1015–1034**

**PUBLISHED 11 NOVEMBER 2015**

<http://www.demographic-research.org/Volumes/Vol33/35/>

DOI: 10.4054/DemRes.2015.33.35

### *Descriptive Finding*

## **Educational attainment and adult literacy: A descriptive account of 31 Sub-Saharan Africa countries**

**Emily Smith-Greenaway**

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## **Educational attainment and adult literacy: A descriptive account of 31 Sub-Saharan Africa countries**

**Emily Smith-Greenaway<sup>1</sup>**

### **Abstract**

#### **BACKGROUND**

More than 60 years ago the international community declared literacy a basic human right. Recognition of its intrinsic value and evidence of its social and economic benefits have motivated an expansive international effort to estimate the percentage of adults that can read, especially in low-income countries where educational opportunities are limited. Population data on adults' educational attainment is commonly used to approximate adult literacy rates. Though increasing evidence from school-based studies of pupils confirm literacy achievement is not universal – even at advanced grades – it remains unclear whether adults' educational attainment is reflective of their literacy.

#### **OBJECTIVE**

This study leverages population-based data that include direct assessments of adults' literacy skills to provide a descriptive account of the proportion of adults that can read at each level of educational attainment. The study focuses on the Sub-Saharan African context, a world region where school participation has expanded rapidly in the last three decades. Because many African adults have discontinued their education at the primary level, the study focuses on basic reading skills at each level of primary school. The study focuses specifically on women, whose literacy has garnered extensive international interest.

#### **RESULTS**

Demographic and Health Survey data from 31 African countries confirm that there are many instances in which women have several years of primary school but cannot read. In fact, in some countries, large proportions of African women who never went to school can read, even as some of their peers who have completed primary school cannot. The weak correlation between educational attainment and literacy is not specific to older cohorts of women, but is also observed among younger women.

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## **CONCLUSION**

The findings demonstrate that educational attainment is generally a poor proxy for literacy, highlighting the need to measure, theorize, and study literacy as empirically distinct from education.

## **1. Introduction**

In 1948, the Universal Declaration of Human Rights declared literacy a basic human right. Ever since, estimates of adult literacy have been of central interest to international organizations. A common technique for generating population estimates of adult literacy has been to use information on adults' educational attainment as a proxy: adults who have completed a certain level of school – typically grade five – are classified as “literate” and those who have not as “illiterate”. This practice is also reflected in academic research that often labels individuals who have never attended school as “illiterate” and those with some (or complete) primary education as “literate” (Basu and Stephenson 2005; Bhat and Zavier 2003; Burchi 2012; Lavelly 2007; Turra et al. 2005).

The continued reliance on educational attainment data to estimate adult literacy rates is surprising, especially in light of mounting evidence from school-based studies in Asia and Africa that many students in advanced grades lack academic proficiency (Zhang 2006). In fact, there is growing interest in identifying the causes and consequences of students' underachievement (Ahmed and Arends-Kuenning 2006; Ansong et al. 2015; Dembélé and Lefoka 2007; Fehrler, Michaelowa, and Wechtler 2009; Glick and Sahn 2000; Kasirye 2009). Yet, despite recognition that many students do not acquire academic skills, the assumption prevails that adults who went to primary school – in some instances many decades ago – learned how to read and have maintained the skill through adulthood.

Assuming that all adults with a certain level of primary education can read is likely to overestimate adult literacy. One reason for this is the quantity-quality issue: school expansion has occurred rapidly in many low-income settings and, in some countries, the increase in the quantity of students participating in school has strained school systems, interfering with the overall quality of education. This concern has received considerable attention in African countries (see, for example, Chimombo 2005 on Malawi and Deininger 2003 on Uganda) where primary school enrollment has increased faster than in any other world region. At the same time, there are concerns over low, and in some instances inefficient, government spending on education across Africa (Colclough and Al-Samarrai 2000), which can further compromise the quality of education (Michaelowa 2001). Another reason relates to the fact that school attendance is not

compulsory in many low-income countries, leading to high rates of absenteeism and prolonged periods out of school. As a result, adults who achieved the final level of primary school may not have started school until age ten or older and could have spent entire years out of school, each of which is likely to have interfered with the development of their academic proficiency, despite eventual completion of primary school (Zuze and Reddy 2011).

Assuming that adults cannot read, based solely on their having never gone to school, could also underestimate literacy. Opportunities to learn to read are not necessarily restricted to the secular, Western-style school system in low-income regions. Instead, adults who have never been to school may have encountered opportunities to learn to read from family members or through local programs. Historical evidence confirms rich literary practices across African societies that far predate colonization and the introduction of Western-style schools (Gomez 2004; Julien 1992). Thus, many adults who never went to school may know how to read and be engaged in literacy practices in their communities (Banda 2010; Prinsloo and Breier 1996; Street 2014).

Adult learning programs also offer formalized opportunities to learn how to read outside of the school setting (Abadzi 1994; Abadzi 2003; Lauglo 2001; Stromquist 2006). Demographic and Health Survey (DHS) data show that in some African countries (e.g., Ethiopia, Namibia, and Senegal) upwards of 20% of women have participated in an adult learning program, and more than 5% of women have in several other countries (e.g., Benin, Democratic Republic of the Congo, Ghana, Malawi, Mali, Swaziland, Zambia, and Zimbabwe). Of course, just as participating in school does not guarantee literacy, participating in an adult literacy program does not either. However, the fact that sizeable percentages of women are participating in these programs suggests that at least some adults are likely obtaining literacy skills outside of the formal school system.

Understanding the relationship between adults' educational attainment and their literacy will not only clarify whether global estimates of adult literacy can be accurately calculated from educational attainment data, but can also inform the vast social science literature on the consequences of education. A handful of studies have shown that, when measured alongside educational attainment, individuals' literacy skills have a strong, independent effect on their fertility (Thomas 1999), health knowledge (LeVine 2012; Stuebing 1997), and health outcomes (Smith-Greenaway 2015), as well as their children's health and survival (Blunch 2013; Glewwe 1999; Khandke, Pollitt, and Gorman 1999; Smith-Greenaway 2013). In fact, a study of Nigeria suggests that the child health benefits associated with women's literacy dwarf those of educational attainment in both magnitude and significance (Smith-Greenaway 2013). A clearer understanding of adult literacy and its relationship with educational attainment may

encourage efforts to more accurately estimate its prevalence, and to incorporate it into social science research, which could result in even more powerful ‘education effects’ than are documented in studies using only measures of educational attainment.

This paper takes the first step in this direction by providing a descriptive overview of the relationship between adults’ educational attainment and their literacy. I focus on the African context, a world region where educational change has been especially dramatic in the last fifty years (Bloch, Beoku-Betts, and Tabachnick 1998). Because a common approach has been to classify adults as literate if they have achieved a particular level of primary education – typically grade five – I focus on adults with primary education, as well as those who have never been to school, and analyze basic literacy skills: the ability to read a simple sentence in any language. The analysis specifically focuses on African women whose literacy is instrumental in promoting their own and their children’s wellbeing (Blunch 2013; Egbo 2000; LeVine 2012; Smith-Greenaway 2013).

## **2. Data, sample, and measures**

I use DHS data, which include an interviewer-administered literacy assessment among nationally representative samples of reproductive-age women – a rare asset in a population-based survey. I make use of the most recent DHS data available in each of the 31 Sub-Saharan African countries where a survey has been administered since 2000 (and thus have literacy data; see Table 1 for more information on the surveys and samples included). The DHS uses a stratified random sampling approach, with clusters providing the primary sampling unit. Within each selected cluster, the DHS randomly samples households. Household heads complete a full roster of members, from which the DHS identifies eligible women (those aged 15 to 49 years old) to participate.

To measure literacy, interviewers ask women to read one of four possible sentences aloud (in their preferred language): “Parents love their children”, “Farming is hard work”, “The child is reading a book”, or “Children work hard at school”. If the respondent does not read every word, the interviewer probes the respondent. Based on their ability to read the sentence, interviewers categorize women as having no literacy skills (did not read any of the words), some literacy skills (read some of the words), or full literacy skills (read all of the words).

I measure women’s educational attainment using their self-reported highest level of primary education completed. Because the duration of primary school varies across the 31 African countries, ranging from five to eight levels, the range in women’s educational attainment varies accordingly. For organizational purposes, I group the 31

countries into the four sub-regions of Sub-Saharan Africa set forth by the United Nations Statistics Division, allowing me to compare country and sub-regional patterns.

**Table 1: List of 31 countries, survey year, and sample information, by region**

<b>Country</b>	<b>Survey Year</b>	<b>Analytic Sample Size</b>	<b>Analytic Sample Women with primary education or less</b>	<b>% Women Ever-Attend Secondary Education</b>
<b>Western Africa</b>				
Benin	2006	17,145	14,398	16.02
Burkina Faso	2010	16,910	14,706	13.03
Cote d'Ivoire	2011-2012	10,023	8,056	19.62
Ghana	2008	4,869	2,228	54.24
Guinea	2005	7,929	7,068	10.86
Liberia	2006-2007	7,007	5,363	23.46
Mali	2006	14,469	12,951	10.49
Niger	2006	9,151	8,180	10.61
Nigeria	2008	33,078	19,547	40.91
Senegal	2010-2011	15,671	12,869	17.88
Sierra Leone	2008	7,307	5,554	23.99
<b>Middle Africa</b>				
Cameroon	2011	15,158	8,013	47.14
Chad	2004	6,072	5,365	11.64
Congo (Brazzaville)	2005	6,988	2,450	64.94
Democratic Republic of the Congo	2007	9,872	5,777	41.48
Gabon	2000-2001	6,110	2,928	52.08
Sao Tome Principe	2008-2009	2,592	1,795	30.75

**Table 1: (Continued)**

<b>Country</b>	<b>Survey Year</b>	<b>Analytic Sample Size</b>	<b>Analytic Sample Women with primary education or less</b>	<b>% Women Ever-Attend Secondary Education</b>
<b>Eastern Africa</b>				
Burundi	2010-2011	9,350	7,745	17.17
Ethiopia	2003	15,971	13,592	14.90
Kenya	2008-2009	8,361	5,563	33.46
Madagascar	2008-2009	17,319	11,517	33.50
United Republic of Tanzania	2009-2010	9,888	7,695	22.18
Uganda	2011	8,520	5,998	29.60
Malawi	2010	22,943	18,652	18.70
Mozambique	2003-2004	12,334	11,120	9.84
Zambia	2007	6,995	4,395	37.17
Rwanda	2010-2011	12,947	10,614	18.02
Zimbabwe	2010-2011	9,146	2,849	68.85
<b>Southern Africa</b>				
Lesotho	2009-2010	7,608	3,963	47.91
Namibia	2006-2007	9,666	3,257	66.30
Swaziland	2006-2007	4,944	2,008	59.39

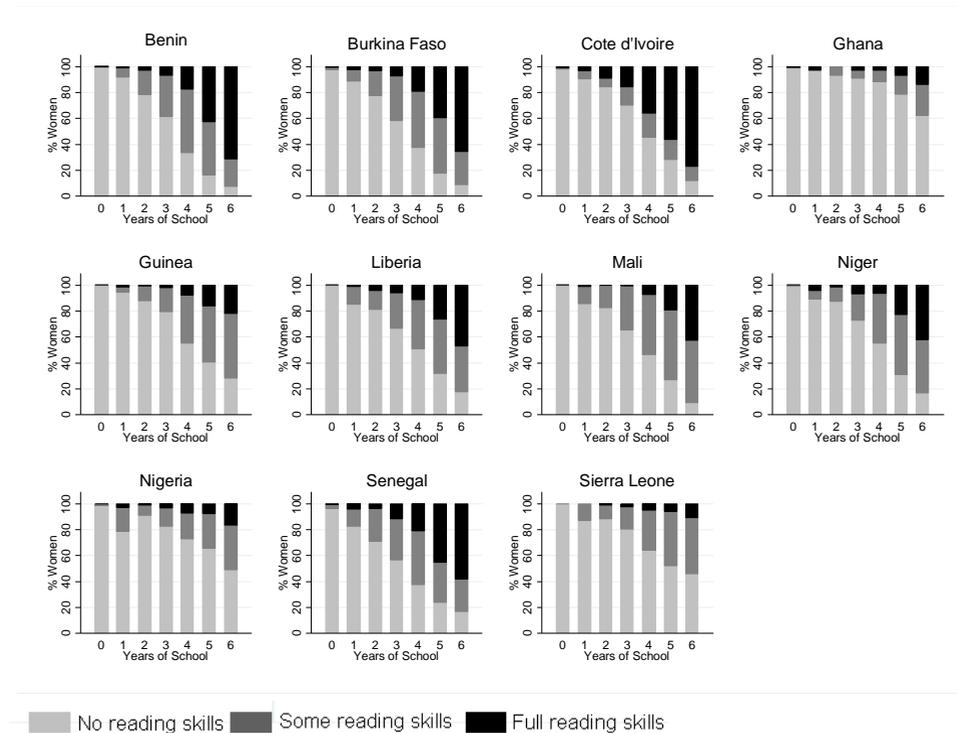
Source: Demographic and Health Survey

### 3. Results

Figures 1a through 1d depict the proportion of women at each level of education that can read, by sub-region and country. Though the percentage of women who can read increases by level of primary education, as anticipated, Figure 1A shows that in many Western African countries, large proportions of women who have completed – or nearly completed – primary school cannot read. In fact, in each Western African country, less than half of women who reached the fifth level of primary school – a common standard for classifying adults as literate – can read. The percentage of women who can read is especially low in Ghana, Nigeria, and Sierra Leone: less than one-third

of women who finished the last year of primary education can read in these countries. Benin, Cote d'Ivoire, and Senegal have a relatively higher percentage of women who can read at the final year of primary school; however, even in these countries one in four women cannot read after completing the highest level of primary school.

**Figure 1a: Distribution of women's literacy skills by primary school attainment, Western Africa**

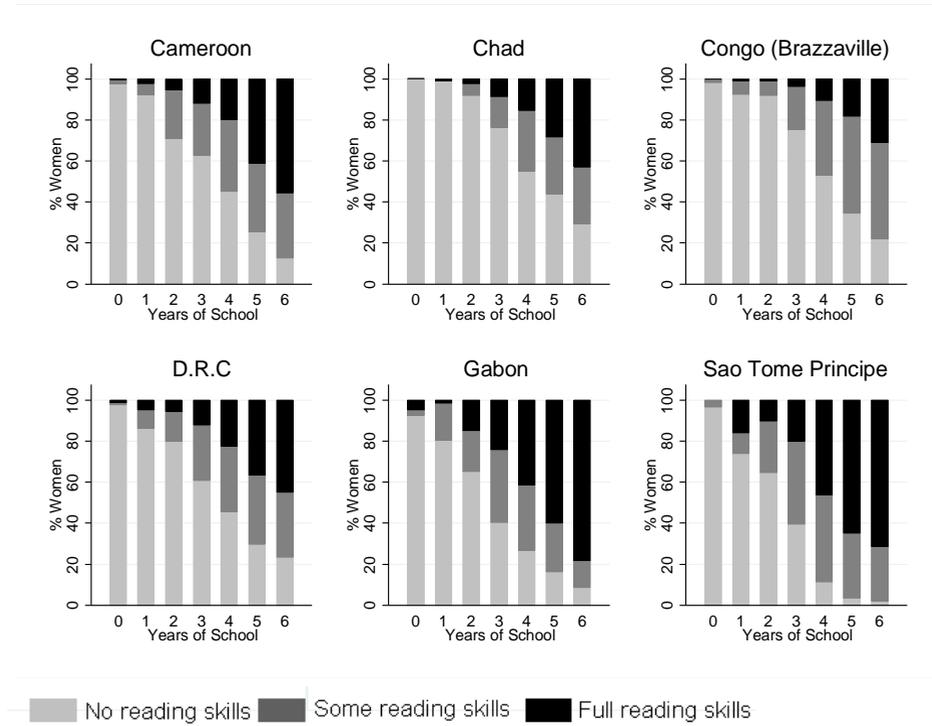


Source: Demographic and Health Survey

Figure 1B shows that the results from Middle Africa are generally consistent with those found in Western Africa: across all levels of primary school, large proportions of women cannot read. For instance, in Cameroon, Chad, Congo (Brazzaville), and the Democratic Republic of the Congo, only about half of women who have completed primary school are able to read. The percentage of women who can read is notably higher at upper levels of primary school in Gabon and Sao Tome Principe. Also, in

Gabon more than 10% of women with no formal education can read, further demonstrating the shortcomings of assuming literacy (or illiteracy) based only on educational attainment.

**Figure 1b: Distribution of women’s literacy skills by primary school attainment, Middle Africa**

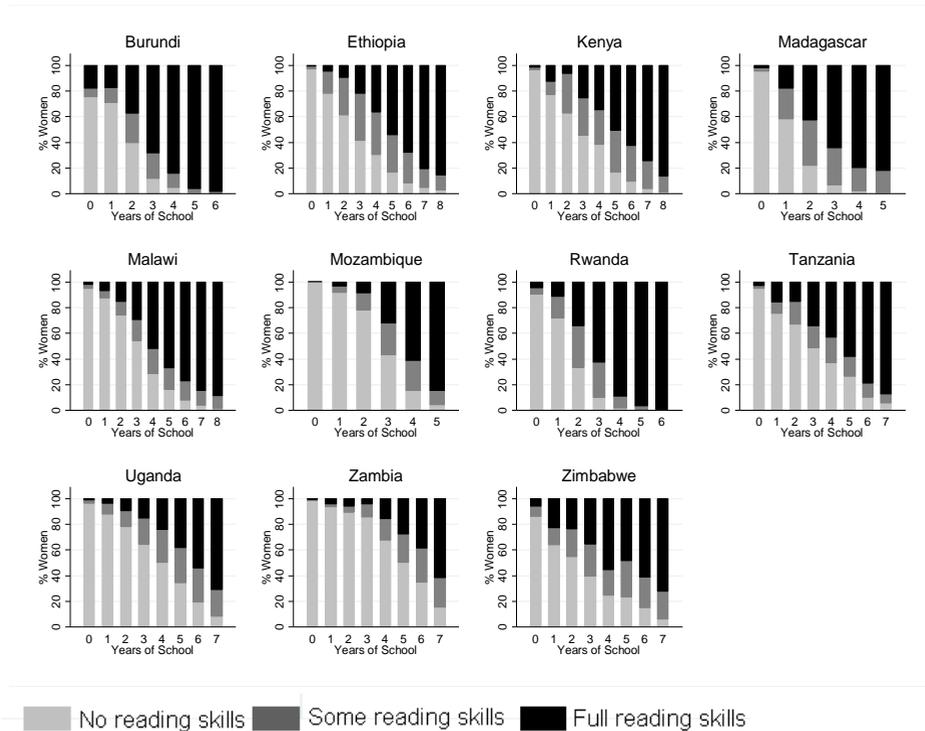


Source: Demographic and Health Survey

The results from Eastern Africa also demonstrate numerous instances wherein large percentages of African women who have never been to school can read. As shown in Figure 1C, the findings are especially striking in Burundi, where as many as 25% of women who have never been to school have (at least minimal) reading skills. Women’s literacy is generally higher in East Africa than in other sub-regions of the continent. In fact, Eastern African women who have completed primary school are nearly universally literate. However, this is largely due to the fact that primary school continues until

grade seven or eight in most Eastern African countries. When focusing on women who completed grade five – a common international standard for classifying individuals as “literate” – closer to half of women can read (e.g., Ethiopia, Kenya, Malawi, Tanzania, Uganda, Zambia, and Zimbabwe).

**Figure 1c: Distribution of women’s literacy skills by primary school attainment, Eastern Africa**

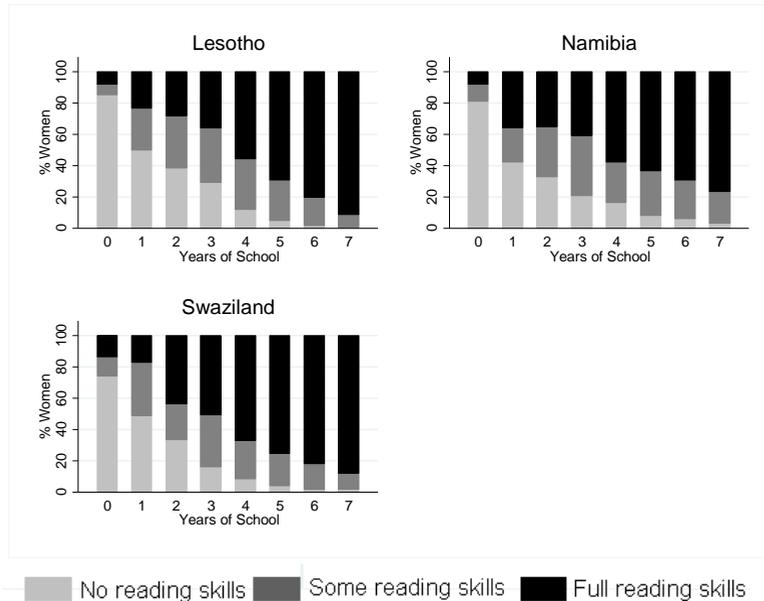


Source: Demographic and Health Survey

Figure 1D shows generally high levels of literacy among primary-educated women in Southern Africa. In Lesotho, Namibia, and Swaziland virtually all women who completed primary school can read; however, again shifting the focus to grade five shows that the proportion of women who can read is closer to three-quarters. Also striking is that, like some countries in Eastern Africa, sizeable proportions of Southern

African women who never went to school can read—ranging from approximately 8% in Lesotho and Namibia to 25% in Swaziland.

**Figure 1d: Distribution of women’s literacy skills by level of primary school attainment, Southern Africa**

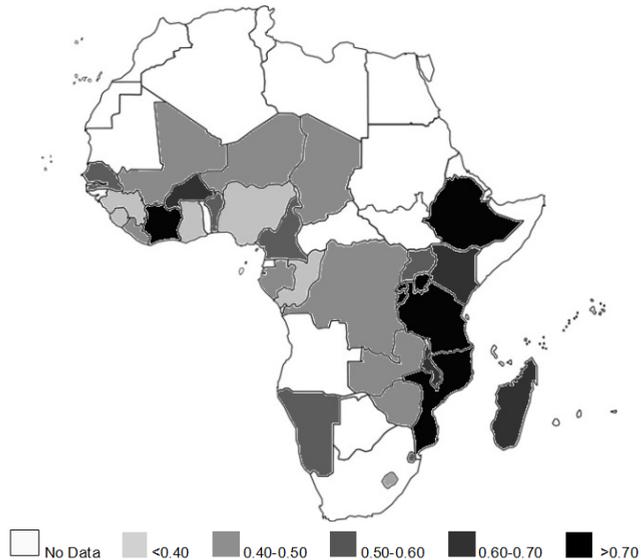


Source: Demographic and Health Survey

Condensing these results, Figure 2 depicts the strength of the correlation between women’s educational attainment and literacy in each of the 31 countries, illustrating one of the study’s main findings: women’s educational attainment and literacy are related, but imperfectly so. In four African countries – Ghana, Nigeria, Sierra Leone, and Congo (Brazzaville) – the correlation is less than 0.40, which according to standard classifications (see, for example, Dancy and Reidy 2004: 176) reflects a ‘weak’ relationship. To put this finding into perspective, in these countries women’s educational attainment has a weaker correlation with literacy than it does with the DHS household wealth index (a standard measure of economic status). The fact that educational attainment is more closely associated with an indicator of economic well-being than reading ability is quite surprising. In fact, the correlation only meets the

threshold for being classified as “strong” ( $>0.60$ ) in approximately one-third of the countries, most of which are in Eastern Africa.

**Figure 2: Strength of Correlation between women’s literacy skills & primary-education attainment across 31 Sub-Saharan Africa countries**



Source: Demographic and Health Survey

Because of tremendous social, political, and educational changes in many Sub-Saharan African countries in recent decades, and because literacy may wane after women have spent more time out of school, the weak association could be driven by older cohorts. To assess whether this is the case, I estimate the correlation separately for women born in five-year intervals from the 1960s to the 1990s (I excluded the very small number of women born in the 1950s from these analyses). As shown in Figure 3, in the majority of countries the strength of the correlation is either similar or weaker among younger generations, confirming that this finding is not driven by older women.

**Figure 3: Correlation between women’s literacy skills and primary school attainment, by cohort, country, and sub-region**

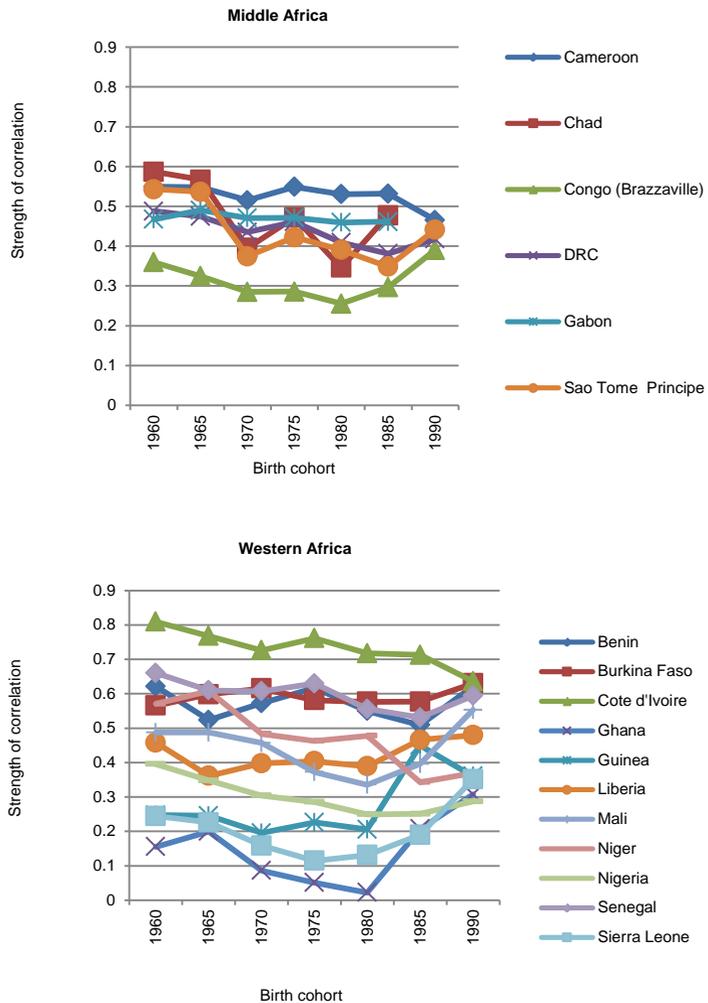
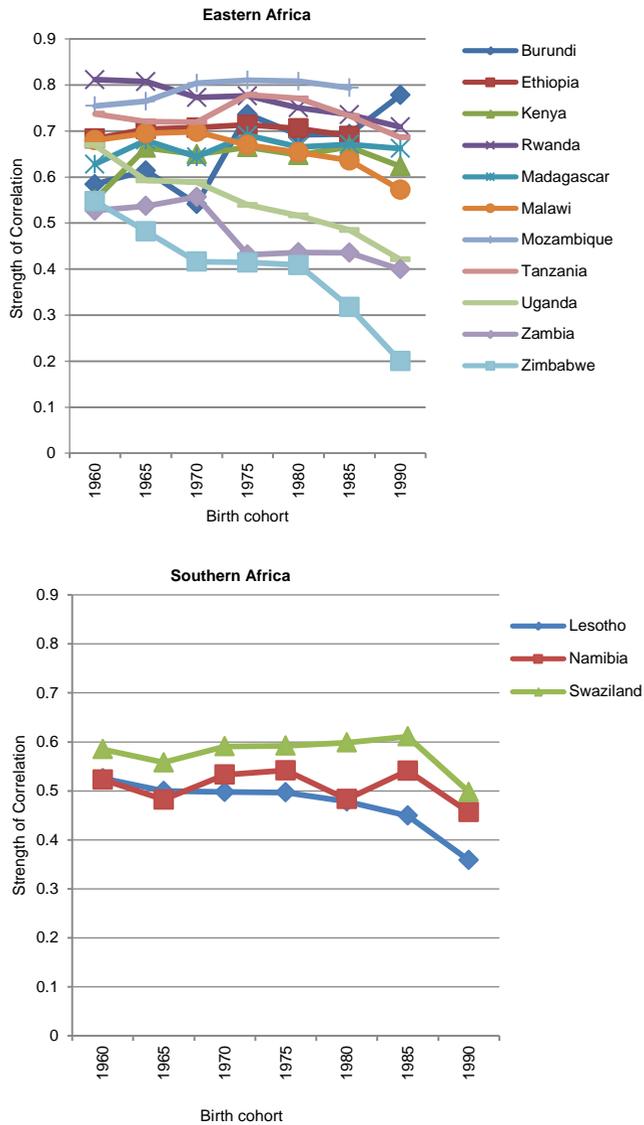


Figure 3: (Continued)



Source: Demographic and Health Survey

## **4. Discussion**

Despite increasing evidence of low academic achievement among today's primary students, it is typically assumed that adults' literacy can be surmised from their educational attainment. Leveraging DHS data from 31 African countries, the results from this paper show that in many countries, most notably those in Western and Middle Africa, a relatively small percentage of adult women can read, even after several years of primary school. Equally striking, many Eastern and Southern African women can read despite having never gone to school. Overall, the mismatch between educational attainment and literacy – both in terms of the large proportions of women with no school who can read and women with several years of school who cannot read – confirms that educational attainment is a poor proxy for literacy, at least among women who never went to secondary school. This finding is true for all cohorts of women.

There is a clear need for a paradigm shift in how we think about and measure adult literacy. This study confirms that the common practice of labeling adults as “literate” if they attended or completed primary education and “illiterate” if they did not go to school would in many instances overestimate women's literacy, and in other instances underestimate it. The results also raise further questions: where are African women who have never been to school learning how to read? Why are some women unable to read even after finishing primary school? Why can the majority of women with primary school read in some African countries but only a small percentage of women can in other countries?

Of course, because the analyses focus only on the primary level of education, it is possible that cross-country variation in its relationship with literacy could be due to distinct patterns of selection into/out of the sample. In countries where few women go to school, literacy could be artificially elevated because the women who make it to primary school are especially privileged. Conversely, literacy levels could be artificially low in the countries where most women go on to secondary school if the current study's sample represents the select under-achievers who stopped at the primary level. However, comparing levels of participation in primary and secondary schools across countries offers little indication that the results are patterned in this way. Moreover, Figure 4 offers an in-depth analysis of data from Ghana – the only country where the DHS administered the literacy assessment to secondary-educated women – which further suggests that selection is not driving the findings. If illiterate women disproportionately discontinue their education at the primary level and literate women disproportionately continue on to the secondary level, we would expect to see a dramatic jump between primary and secondary school in the percentage of women who can read: however, the results instead show a steady, linear increase, suggesting that selection is not driving the patterns observed here.

Figure 4 also attests to the need to assess literacy among all adults, including those who went to secondary school. The DHS's standard protocol (except in Ghana) is to assume that every woman who ever went to secondary school can read. As shown in Figure 4, however, merely 61% of secondary-educated Ghanaian women can read, meaning that the DHS assumption would misclassify nearly 40% of secondary-educated women as literate. Administering the literacy assessment to all adults is unlikely to require significant time or financial investment, yet this minor adjustment would yield more accurate literacy data and could be instrumental to future demographic research exploring the causes and consequences of literacy.

The results from this study clearly demonstrate that a woman's educational attainment – or lack of education – does not always tell us whether she can read. Future efforts to directly measure and study adult literacy as a distinct marker of educational experience will not only correct a flawed assumption, but may also aid efforts to better understand education's full effect on demographic processes.

## **5. Acknowledgements**

I acknowledge the support of the Predoctoral Traineeship in Family Demography (No. T-32HD 007514) by the Eunice Kennedy Shriver National Institute of Child Health and Human Development to the Pennsylvania State University Population Research Institute and assistance provided by the Population Research Center at Penn State University, which is supported by an infrastructure grant by the National Institutes of Health (R-24HD 041025). I also acknowledge the support from an American Dissertation Fellowship from the American Association of University Women and the Africana Research Center at Penn State University. Thanks to David Baker, Michelle Frisco, Jenny Trinitapoli, Kevin Thomas, Christie Sennott, two anonymous reviewers, and the Editor for feedback on earlier drafts.

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