



Changing literacy instruction in Kenyan classrooms: Assessing pathways of influence to improved early literacy outcomes in the HALI intervention

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ABSTRACT

This study uses data from the Health and Literacy Intervention (HALI) program evaluation, an in-service teacher training program focused on early grade literacy instruction for class one teachers. We assess how changes in classroom instructional processes impacted by the HALI teacher training were associated with improved early literacy outcomes for children. We find that experimentally induced increases in exposure to print—measured both through changes to time spent reading in class and through print displayed in the classroom—were associated with improvements in students' reading fluency and reading comprehension. Implications for global education efforts to improve learning outcomes are discussed.

1. Introduction

Literacy is more than simply the ability to read and write. Literacy skills provide the gateway to effectively connecting to, interpreting and discerning the world in which one lives. In efforts to improve the education and literacy levels of their populations, countries across Sub-Saharan Africa have made tremendous strides in increasing school access to more children over the past fifteen years (UNESCO, 2015). Yet literacy levels still remain low across the continent. At around 72%, sub-Saharan Africa as a region has the lowest youth literacy rate in the world (UNESCO, 2012). In Kenya specifically, dramatic growth in primary school enrollment—from 65.4% in 2000 to 84.9 in 2012—has shown some success, with youth literacy rates increasing slightly from 82.4% in 2007 to 85.8% in 2015 (World Bank, 2017).

Research suggests that despite being in school, a large portion of children fail to learn functional literacy skills in the first three years of primary school (Gove and Cvelich, 2010; Uwezo, 2013). With global education goals shifting from access to school to access to high quality education and learning (United Nations, 2015), early literacy skills are critical to ensuring learning and literacy outcomes. While evidence is starting to accumulate as to what school-based strategies may work to improve literacy in early grades in sub-Saharan Africa (McEwan, 2015; Ganimian and Murnane, 2016) and in Kenya in particular (Piper and Zuilkowski, 2015; Piper et al., 2014; Piper et al., 2016), most studies do not unpack the mechanisms through which different strategies work (or do not). Research on which strategies support early literacy learning

have been conducted almost exclusively in high-income countries (e.g., Snow et al., 1998; Snow et al., 1995). What specific instructional strategies are malleable to intervention and promote early literacy skills, particularly in linguistically diverse contexts in sub-Saharan Africa? More research is needed on the key elements of successful programs.

Using data from the Health and Literacy Intervention program evaluation (HALI; Jukes et al., 2017), this study assesses which key classroom instructional practices impacted by the program were associated with improved student literacy outcomes over the course of one school year. We assess instructional practices related to the medium of instruction (i.e., using a written medium), the instructional focus (i.e., explicit instruction of letters and sounds, explicit instruction of phonological blending and segmenting), and print exposure (i.e., time spent reading in class and the display of print in the classroom).

1.1. Instructional practices that promote early literacy skills

A growing literature over the past three decades has enabled a deep understanding of specific literacy instructional practices that promote children's literacy skills. This work has been conducted almost exclusively in high-income countries. However, because of the similarities across languages of learning the relationship between oral language and print that represents that language, it may provide a framework from which to begin to study similar processes in other contexts.

The provision of high-quality literacy instruction is

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multidimensional. In reviewing the literature on effective teaching practices in early learning classrooms of children ages five to eight, Hall (2013) discusses the importance of balancing the written form of language with its meaning, uses, and purposes. In addition, providing students opportunities to engage with text – both by reading and writing – is critical to a host of early literacy skills such as phonological awareness, word recognition, spelling patterns, vocabulary, punctuation, grammar, and text structure (Topping and Ferguson, 2005; Wray et al., 2001; Wilkinson and Townsend, 2000; Parr and Limbrick, 2010; Mazzoli and Gambrell, 2003).

In settings with low-income and ethnically diverse students, effective teachers devote more time to reading activities (including independent reading and writing in response to reading) than the moderately and least effective teachers in those same settings (Taylor et al., 1999, 2000; Taylor and Pearson, 2002; Topping and Ferguson, 2005). Time spent in reading activities is shown to be particularly beneficial for poor readers (Mol and Bus, 2011). In addition, successful literacy practices involve direct teaching of skills that can be applied in reading and writing. Unlike learning to speak, which children learn through exposure, reading and writing skills do not happen naturally (Lyon, 1998). And it has been found in meta-analyses and research reviews that most children benefit from explicit instruction to acquire basic literacy skills (Lyon, 1998; Stanovich, 2000) followed by systematic practice of those skills (NICHD, 2000; Snow et al., 1998). In other words, not only teaching children word recognition through memorization, but through teaching students explicit skills to recognize words (e.g., blending sounds and syllables; Taylor et al., 2000; Topping and Ferguson, 2005).

Exposure to print (in addition to time spent reading) is another critical predictor of literacy skills. A meta-analytic review found that from infancy through early adulthood, across outcome domains of reading comprehension and technical reading and spelling, there were moderate to strong correlations with print exposure (Mol and Bus, 2011). Exposure to print was an important predictor of literacy at all ages, with an escalating affect for older ages. Specifically, in preschool and kindergarten, print exposure explained 12% of the variance in oral language skills, in primary school 13%, in middle school 19%, in high school 30%, and in college and university 34% (Mol and Bus, 2011).

1.2. The HALI intervention

The HALI intervention focused on two aspects of improving Grade 1 children's capacity to learn: health (through anti-malarial intervention) and quality literacy education (through in-service teacher training). Since there were no impacts of the health intervention on children's learning outcomes (Halliday et al., 2014), in this study we focus only on the literacy intervention. The literacy intervention consisted of three components: (1) in-service training, which comprised of a 3-day workshop at the start of the school year that included developmental theories on literacy acquisition in a subsequent language (i.e., not the child's first language) and guided opportunities to learn and use provided instructional materials, followed by a 1-day problem-solving and instructional materials development workshop four months after the commencement of the school year; (2) a manual containing 140 sequential, semi-scripted lesson plans for literacy sessions either for Kiswahili or English, and (3) weekly interactive text messages providing brief instructional tips and motivation to implement lesson plans. The intervention is described in greater detail elsewhere (Dubeck et al., 2015).

The literacy intervention sought to increase children's exposure to print and improve teachers' instructional practice by building on effective practices that were already in use locally. For example, Dubeck et al. (2012) found that during Kiswahili instruction, some teachers were explicitly teaching the relationship between sounds and syllables. The HALI intervention sought to expand this practice in Kiswahili and to encourage explicit blending of sounds in English and in general, to

help teachers use literacy skills in one language to aid literacy acquisition in another. The program also aimed to increase children's engagement with print by encouraging teachers to use written modes of instruction during common practices such as song and oral reading, and providing teachers with opportunities to create materials during the trainings to increase the amount of print in the classroom.

Main impacts of the program on teaching practices and children's early literacy skills are reported in Jukes et al. (2017). This study found that the literacy intervention improved classroom practices with effect sizes from 0.57 to 1.15 standard deviations, including greater time spent using written modes instruction and focusing on letters and sounds. In addition, the program improved three of four primary measures of children's early literacy skills at the end of both the first and second years of the program with effect sizes ranging from 0.12 to 0.64. The program also reduced student dropout from school from 5.3 to 2.1%. This study builds upon the reports of the direct effects of the HALI intervention.

1.3. The present study – a multiple mediation analysis

The present study builds on analyses of the direct impacts of the HALI intervention on classroom instruction and children's literacy outcomes reported to assess the relations between specific literacy practices and early literacy skills. Our analysis is also guided by an earlier observational study in the region (Dubeck et al., 2012) and considers both practices that were already in use locally before the intervention (e.g., connecting sounds and syllables), and practices that were deficient and encouraged through the intervention (e.g., interaction with text, blending and segmenting letters to form words and sounds). Using multi-level structural equation modeling (MSEM; Preacher et al., 2010), we consider the pathways between experimentally induced impacts on classroom literacy instruction and practice on Kenyan children's Kiswahili early literacy outcomes (Fig. 1).

This study contributes to the present body of knowledge in a number of ways. First, while several impact evaluations to improve students' academic achievement and literacy outcomes have been conducted over the last few years in sub-Saharan Africa in general (see McEwan, 2015 for a meta-analysis) and in Kenya in particular (Piper et al., 2014, 2016), this is the first to examine the mediating pathways of experimentally induced classroom instructional practice and learning outcomes in this context. Second, to our knowledge this is one of the first studies to assess which specific instructional practices are associated with children's literacy outcomes in Kenya. We guide our analysis with literature on successful literacy instructional practices that have been identified in other contexts to assess their applicability to teaching in the lingua franca of the region (i.e., English and Kiswahili) in Kenyan schools. The findings allow for more targeted approaches for training teachers to provide high quality literacy instruction.

2. Methods

2.1. Sampling procedures and participants

Data come from the first school year of the HALI literacy intervention impact evaluation, which occurred between January 2010 and March 2012 together with a program of screening and treatment for malaria. The evaluation involved a cluster randomized trial (Brooker et al., 2010), in which 101 public primary schools were randomly assigned to one of four arms receiving either: (i) the malaria intervention alone; (ii) the literacy intervention alone; (iii) both interventions combined; or (iv) neither intervention. There was no impact of the malaria intervention on any literacy outcome (Halliday et al., 2014). Thus, in this study, as with previous studies (Jukes et al., 2017), we collapse both treatment arms that received the literacy intervention (ii and iii) as treatment schools ($N = 51$ schools), and both arms that did not receive the literacy intervention (i and iv) as the control arm

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