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Literacy retention and language preferences for girls and boys during school closures: Lessons from Complementary Basic Education in Ghana for post COVID-19 schooling

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Abstract

As children spend unprecedented amounts of time at home as a result of the COVID-19 pandemic, it is important to understand whether the role of mother tongue language and home factors matter for learning loss in literacy. This paper provides empirical evidence to understand the role of mother tongue education in early primary grades, home resources and support in learning loss in multilingual learning environments. Using data from the Complementary Basic Education (CBE) programme in Ghana, we found that large proportions of disadvantaged students who had attained beginners' level reading skills during the CBE programme, reverted to nonperformers during their time away from school. This learning loss was more pronounced for boys than for girls. Our results demonstrate that, a widening of literacy gaps could be expected for girls who do not receive the support in a language that they understand or who do not have the resources, support or activities at home to continue to learning. These are girls who are likely to fall behind, and potentially make the slowest recovery. Widening literacy gaps for boys, on the other hand, were only influenced by resources, support or activities at home, but not by language. We argue that schools and teachers must pay closer attention to recovering losses, particularly of girls, and ensure that language of instruction is not a barrier to this recovery.

Introduction

Ensuring continuity of learning during and after the COVID-19 pandemic poses a serious challenge for all governments around the world. This is likely to be particularly the case in low and middle-income countries (L/MICs) where many children already lack basic foundational skills and long school closures are likely to make it worse. During school closures, many L/MIC governments are relying on the use of radio, television and mobile phones to support education at home. Given the low penetration of these technologies in many areas, printed materials may be the most accessible to support learning at home. The ability to read and understand content in printed material, as well as what is being delivered through electronic media sources is important so that children can continue learning during school closures. This is particularly necessary for those living in multilingual environments. The language in which resources are written or communicated and access to learning resources at home will be key to continuity in learning during school closures and when they reopen.

For early years education, the use of resources written in the child's mother tongue enables children to become familiar with and value their own language, understand the basic properties of literacy acquisition and ultimately smoothen the transition into other languages of instruction (Cummins, 1979; Carter et al. 2020a; Carter et al., 2020b). Many early learning programmes in multilingual environments use mother tongue instruction to improve foundational reading skills (Brock-Utne, 2010; Trudell, 2009; Piper, Zuilkowski, and Ong'ele, 2016). Well-developed multilingual environments ensure that children are familiar with multiple languages, not just through pedagogical approaches but also through the content of the curriculum (Brock-Utne and Alidou, 2011). Indeed, children become more actively engaged in education when they are taught in a language they understand (Brock-Utne and Alidou, 2011). Prior to the COVID-19 pandemic, it was estimated that as many as 40% of global student population did not have access to teaching in a language they readily understand (UNESCO, 2016), which can impede their ability to continue learning during school closures. Given the evidence to date, language of instruction deserves to be a key focus for assessing learning loss during the time of the COVID-19 pandemic, and for identifying strategies for 'building back better'.

Ghana presents an interesting country in which to explore the effect of access to mother tongue instruction on literacy loss during school closures. In Ghana, the language policy stipulates that teaching in the first three years of primary education should be in the child's mother tongue. However, government schools can offer only 6 official mother tongue local languages in lower primary school for classroom instruction. From the fourth year of primary school, the language of instruction shifts to English. Ghana has relied on mother tongue instruction to provide a second chance education for out of school children. This consists of a 9-month Complementary Basic Education (CBE) programme which aims to close gaps in basic literacy and numeracy to enable a smooth re-integration into mainstream government schools. In practice, the CBE programme is offered in 11 out of around 80 local languages and by 2019 it had reached around 250,000 children aged 8-14 years (50% female) who had never been to school or who had dropped out from primary school.

The CBE programme can provide evidence that helps to understand the potential linguistic challenges faced by both boys and girls during the current school closure. As children spend an unprecedented length of time at home as a result of the COVID-19 pandemic, it is important to understand whether learning in a familiar language prior to the closures matters for stemming literacy loss. Understanding this has implications for efforts to close learning gaps when schools re-open. Crucially, it is also important to know whether children with access to learning materials and support did not suffer as much loss relative to those who lacked these in the home environment, and how this differed by gender. Thus, in this study, we examined the extent to which the language of instruction may have contributed to literacy loss during school closure - in our case the period between the end of the CBE programme and the start of education in government schools. Also, we were interested in understanding whether learning loss in literacy differs for boys and girls and the role of language and home resources in enabling retention of literacy during this transition period. Local cultural norms and practices may affect the learning trajectory of boys and girls differently because of how it influences who has access to learning resources and home support, for example. In this paper, we provide empirical evidence using data collected on the CBE programme to understand more deeply the role of mother tongue education and home factors in ensuring learning continuity for boys and girls in a complex multilingual learning environment.

Given that students need to practice or revise what they learn in school in order to retain literacy, teachers give their students homework during school term. It is for this reason also that during summer vacations primary aged school children in the United States have been found to suffer learning loss, particularly those from low-income backgrounds (Fairchild, 2002; Kuhfeld, 2019). The Education Endowment Foundation (2020) gathered evidence from 11 studies from the Global North to estimate the learning loss as a result of time out of school during long school holidays, finding that children from disadvantaged backgrounds are likely to be around 36% worse off than their more advantaged peers as a result of this time out of school.

Similar findings are emerging in studies from the Global South. A study by Slade et al. (2017) for Malawi showed that children were affected in literacy due to long breaks between academic years. They found that children's literacy and numeracy losses were similar in magnitude when children transitioned from primary school grade 1 to grade 2 and from grade 2 to grade 3. They did not find any gender differences in such losses. Sabates, Carter and Stern (2020) found that about 66% of previous numeracy gains during the CBE programme were lost during the transition period. Carter et al.'s (2020a) study further revealed that low achieving boys and girls were affected by learning loss in numeracy, amounting to 60% and 64% of previous gains, respectively, during the transition from CBE to government school. During the current school closures due to COVID-19, Kaffenberger (2020) estimates that about one third of learning is expected to be lost for children in grade 3. In addition, Kaffenberger (2020) estimates that the expected learning loss is likely to accumulate over time if there are no mitigating interventions. Such evidence points to the need for mitigating interventions after schools re-open.

Objective and Research Questions

The prior studies reviewed above highlight the importance of understanding the extent of learning loss due to time out of school, and who is most affected by it. Our paper extends this analysis by looking at the combined effect of preferences for mother tongue language of instruction, together with resources and support for learning at home which are particularly relevant for literacy acquisition.

For this analysis, we use the transition period between the end of the CBE programme and the start of formal education in government schools to estimate whether there is any learning loss as a result of children being out of school. Empirically, we use longitudinal data from the CBE programme to construct learning gains in letter sound identification and reading comprehension over the nine-month period of the CBE programme (June 2017), and measure the skills again at the start of entry into government school (October 2017). This amounts to nearly four months out of school during the school closure over the summer period. The research questions of this paper are:

1. What is the learning loss in foundational literacy experienced by children who participated in the CBE programme over the four months' summer period and prior to entry into government schools? Does learning loss in foundational literacy differ by gender?
2. What is the role of language (both understanding of the language and preference for mother tongue education) in enabling continuity of foundational literacy during this transition period? Are there differences by gender?
3. What is the role of home learning support and resources in mitigating learning loss in foundational literacy during this summer period? Are there differences by gender?

When CBE children move into government schools many are placed in lower primary grades where their own mother tongue instruction is either maintained or replaced with a *different* local language of instruction. Some are placed in upper primary classrooms, then mother tongue language becomes a subject and English becomes the official language of instruction. In this paper, our analysis focuses on foundational literacy for those children who moved into primary classrooms with the same language of instruction used during the CBE programme – in other words, learning environments in government schools where the language of instruction would be the same as the language used in CBE schools. Yet, this occurs in a complex multilingual environment because the language of instruction may not necessarily be the same as the main local language spoken by some children at home, even when the language of instruction is the same as the one used by the community. This may present

challenges for some children's level of understanding of lessons. Given this context, the paper provides a deeper exploration of literacy loss during time out of school, focusing on the role of language as identified by children's preference for mother tongue education as well as their understanding of the language used by teachers. Furthermore, we include the intersections with home factors particularly because of how important they are in multilingual environments.

Methodology

Description of the CBE Programme and Sample

The Complementary Basic Education (CBE) programme in Ghana is designed to provide out of school children (ages 8 to 14) with access to basic literacy and numeracy instruction in eleven mother tongue languages. The 9-month accelerated learning programme is aimed at delivering the knowledge and skills required for children to successfully transition into nearby government primary schools upon completion of the programme. CBE began in 1995 (initiated by School for Life) and was expanded in 2013 with support from the United Kingdom's Department for International Development (DFID) and the United States Agency for International Development (USAID). This paper is based on data collected during a two-year DFID-commissioned longitudinal, mixed-methods study from 2016 to 2018.

The longitudinal study was designed to collect data from a stratified random sample of 40,000 students enrolled in the CBE programme in September 2016. Stratification was done by language of instruction, which was determined by region and the provision of the CBE programme by implementing partners. The original sample consisted of 2,360 children located in the Northern region (66%), Upper West (12%), Upper East (11%), Brong Ahafo (9%) and Ashanti (2%). Throughout the study, four rounds of data collection were completed: beginning of the CBE programme in October 2016, end of CBE programme in June 2017, beginning of government school in October 2017, and end of first year in government school in June 2018. Over this time, sample attrition was high due to discontinuation of schooling following the CBE programme, drop out from formal school, migration and absence at the time of data collection (irregular attendance is high due to seasonality and household chores).

Carter et al., (2020b) demonstrated that students with data available across all the four time periods were more likely to be higher achievers, missed fewer school days, and were more engaged with their learning activities than students who dropped out from the programme.

For the purpose of estimating learning loss in foundational literacy we restricted our sample to students who were tested in the same language in which they studied at the end of the CBE and at the start of the first year in government schools. Nearly 47% of the CBE students changed language of instruction when they transitioned into government schools. Since these students were tested in different mother tongue languages at the end of the CBE programme and start of formal mainstream school, any learning losses during the transition period are likely to be confounded by changes in linguistic familiarity between the two languages. Therefore, we restricted the sample to those students where the official language of instruction as reported by the CBE programme was the same mother tongue as used for teaching in the early grades of primary school. This corresponds to 665 children as indicated in Table 1.

The fact that the official language of instruction in government schools is the same as the one used by facilitators of the CBE programme is not a guarantee that this will facilitate children's understanding of classroom lessons. As indicated in Table 1, only 40.6% of children reported that the language used by the teacher during the CBE programme was the same as their own language, 43% indicated that they were able to understand the language used by the CBE teacher, whereas 74.5% reported a preference for mother tongue education. This highlights the fact that although the CBE programme supports the use of local language, in practice this may not always be possible. By using children's responses to understand their preferences for mother tongue education we are able to capture the complex multilingual contexts of Ghanaian classrooms.

With respect to the sample, Table 1 shows some interesting differences between children for whom we have full information in the learning trajectories (used by Carter et al., 2020a and 2020b) and the subsample used in this paper. In particular, compared with the full sample, children in our restricted sample were less likely to work outside of the home, missed fewer days of school and were placed in higher grades relative

to children who changed language of instruction between CBE and government schools. While our restricted sample consists of children who were more likely to have a television at home and to be living in households with access to electricity, these children were less likely to have access to reading, writing and counting activities at home or books at home.

Zero Scores in Literacy

The main outcome of interest for our study is student performance in foundational literacy. We focus on two measures that were selected from a range of literacy subtasks administered during the CBE program (rounds 1 and 2 of data collection) and in formal school (rounds 3 and 4 of data collection). These measures are letter sound identification and reading comprehension. Given the slight adjustments in tests over time, we have more confidence that these measures are able to capture changes over time, particularly when using 'zero scores' as an indicator of non-performance in these subtasks.

By focusing on changes in the proportion of children who are unable to correctly identify a single letter sound or answer a single comprehension question, we are able to provide important insights into the impact of learning loss for children struggling with tasks at either end of the difficulty spectrum (i.e. letter sounds is an introductory reading task, while reading comprehension is the ultimate goal of early grade literacy). Children who are unable to correctly identify any items from these tasks are arguably at the greatest risk of falling behind their peers and it is therefore important to highlight the factors that contribute to this.

Key Factors Related to Learning Loss

Three key factors are used in this paper to estimate their potential role as enablers of continuity in learning between home and school during the transition period. These factors are preference for mother tongue education, availability of home learning support and home learning resources.

Preference for mother tongue education is captured by three indicators related to children's preferences for learning language. These indicators were recorded on four item scales (i.e. never, sometimes, most of the time, always), but we reclassified them

into two categories for empirical analyses (i.e. never and sometimes / most of the time and always). All questions refer to learning during the CBE programme, which is prior to the transition. The first indicator relates to children's ease of learning through mother tongue, which was captured from the following statement: "*I found learning easier when I was taught MOSTLY in my mother tongue*". The second indicator relates to the language used by the government school teacher and whether this was easy for the children to understand. This was captured by the following statement: "*The language the teacher used was easy for me to understand*". The last indicator relates directly to children's responses that the language used in class was their own language: "*The language the teacher used was my own language*".

Availability of home learning support was obtained also from self-reported answers by children on the following statements: "*when I did not understand things at school I asked my mother or female adult*" and "*when I did not understand things at school I asked my father or male adult*". As with the mother tongue education factors, we created a dichotomised variable for our analyses (i.e. those who never or sometimes ask an adult for help versus those who ask most of the time or always). The other indicator relates to whether the child was given enough time to study at home. This came from the statement "*I was not given enough time to study and review at home*" which we reclassify into a binary yes/no to indicate whether enough time was given to study at home.

Availability of home learning resources was obtained from indicators including whether children had access to activities involving reading, writing or counting, as well as the availability of books or other reading materials. We also include whether there is either a television, radio or mobile phone at home.

Table 1: Descriptive statistics of main variables: sample with complete information and sample who transitioned into same language

Variables		Description	Sample complete trajectories	Sample same language	Sig
Language	Mother tongue	% prefer to learn in mother tongue	79.3	74.5	**
	Teacher	% language use by CBE teacher easy to understand	45.9	43.3	
		% language use by CBE teacher same as child's language	44.6	40.6	**
Home learning support	Time study	% have time to study at home	68.7	71.2	*
	Asking for support	% asked most time / always for help to adults at home	21.5	21.7	
Home learning resources	Activities at home	% with reading of counting activities at home	73.1	70.1	*
	Reading Materials	% with books or reading materials at home	72.6	68.2	**
	TV	% with TV	15.6	18.4	**
	Radio	% with radio	52.2	50.7	
	Mobile Phone	% with mobile phone	72.5	66.6	**
	Gender	% female	49.2	46.0	
Controls	Lessons easy	% found most of the lessons easy during the CBE	35.8	34.0	
	Effort	% most of the times tried hard during CBE	53.4	46.5	**
	Work	% working outside of the home (paid or unpaid)	43.5	35.6	**
	Age	Average Age (sd)	10.3 (2.2)	10.8 (1.9)	
	HH size	Average household size (sd)	9.9 (5.7)	8.3 (4.3)	*
	Attendance	Average missed days at school (out of 5) and (sd)	1.1 (1.2)	0.9 (1.6)	*
	Grade placement	% placed at grade 4 and above	54.6	64.9	**
	Electricity	% access to electricity at home	33.7	38.8	**
	Poverty	% with less money than others in village	63.6	55.6	**
	Sample size	Number of observations	1,166	665	

Note: Asterisks *, ** indicate statistical significance at 5 and 1% level, respectively. Samples with complete trajectories are those for whom there is full information across 4 time periods whereas sample with same language are a subsample of those who transitioned into same language from CBE to government schools. The proportion of female students in the same language sample is 46%.
Source: CBE Monitoring and Evaluation 2016-2018.

Other Control Variables

In addition to the main factors which are the focus of this paper, the longitudinal study of the CBE children contains several important indicators which are related to learning losses and therefore are used as control variables in this paper. These are the age of

children (range from 8 to 15 years) and the grade in which children were placed in government schools after the transition period (between primary 2 and primary 6). We also included self-rated opinions on school effort obtained from the statement "*I tried hard to learn my lessons*" and difficulty of lessons in school obtained from the statement "*I found most lessons easy when I was at school*". These factors help to account for perceptions about learning which are associated with both learning in a different language and potential learning loss during the transition.

We included an indicator for school attendance measured by the number of days the child said that they attended school in the week prior to the survey – a common practice in demographic and household surveys. In order to account for the potential role of sociodemographic factors and resources available in the household which may mitigate or intensify learning loss we included household size, whether the household had access to electricity, whether the child reported doing any work outside the home (paid or unpaid), and whether the child ranked their household among the poorest in the community (relative to average or among the richest). All household level information was reported by children and it was designed and piloted to ensure that questions could be asked by the children. The questionnaire was administered to the children individually and orally in local language. Our analyses are also performed separately for boys (54% of the sample) and girls (46% of the sample) to capture more clearly the gendered dynamic of learning loss during the transition.

Analytical Approach

In order to estimate the relative learning loss in foundational literacy during the transition period we use ordinary least squares regression. Specifically, we estimate the conditional change in learning captured by the parameter β_1 in the following equation:

$$L_{it} = \beta_0 + \beta_1 Time + \beta_2 F_i + \gamma X_{it} + e_{it} \qquad (1)$$

where *L* is the proportion of zero scores in letter sound identification or in reading comprehension by child *i* in time *t*; Time is a measure before and after the transition, in other words, at the end of one academic year and the start of the next academic year. *F* and X stand for the factors and control variables respectively which we are using to estimate the conditional model.

In order to estimate preference for mother tongue, as well as factors related to home learning support and resources, we add to equation (1) an interaction term between Time and Factors which then captures the relative difference in learning loss between different groups. This is demonstrated by the following extension to equation (1):

$$L_{it} = \beta_0 + \beta_1 Time + \beta_2 F_i + \beta_3 F_i | Time + \gamma X_{it} + e_{it} \quad (2)$$

where the parameter β_3 is equivalent to the difference-in-difference (DID) estimator. In equation (2), β_1 continues to measure the conditional average learning loss during the transition but this time for children with specific combination of factors. β_2 measures the average difference in zero scores at the end of the CBE programme between different groups of children according to the factors of interest. In other words, β_2 measures how different these children were in their foundational literacy before the transition period (and hence time at home) started. These models are estimated for the restricted sample of children for whom the language of instruction as reported by the CBE programme is the same as the official language of instruction in the government school. All models are also estimated by gender.

Results

What is the Learning Loss in Foundational Literacy Experienced by Children who Participated in the CBE Programme during their Transition into Government Schools?

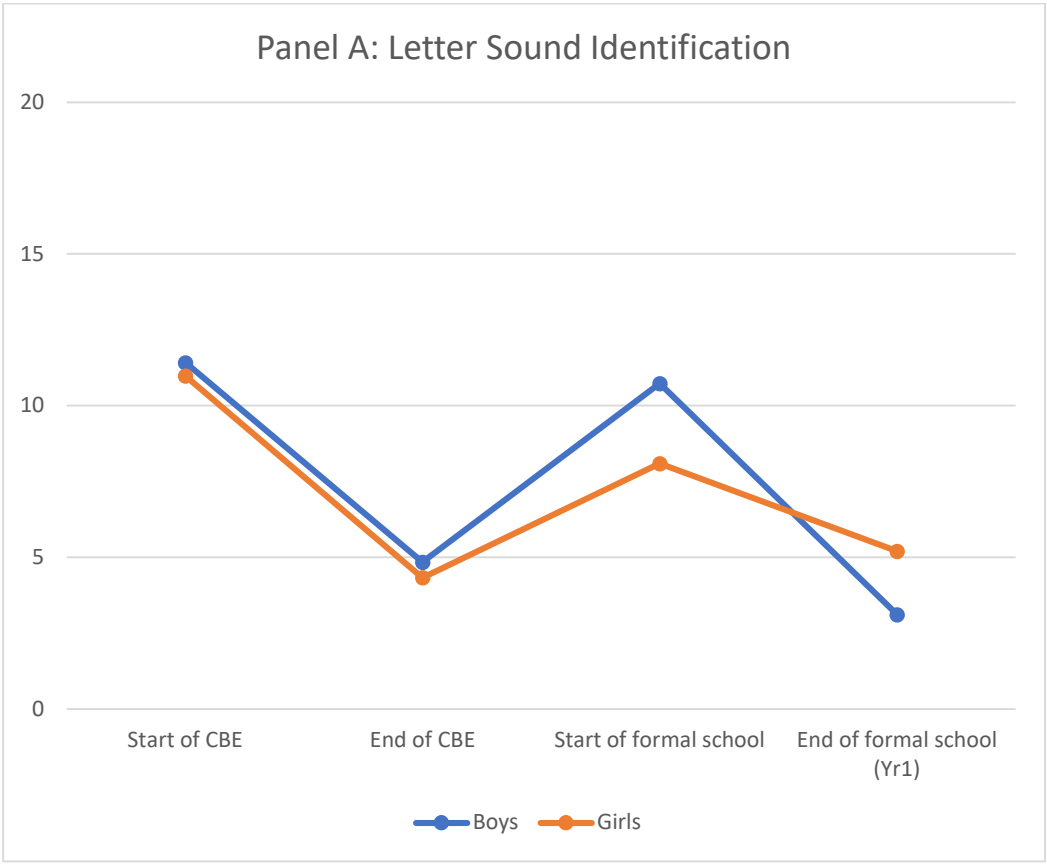
We provide an overview of the overall trajectory in zero scores in literacy subtasks to contextualise the learning loss during the transition. For simplicity, we refer to students who are unable to identify any items from a given task (i.e. those with zero scores), as 'nonperformers'. Therefore, throughout these results, it is important to keep in mind that lower percentages are preferable (as the goal is to decrease the proportion of nonperformers in letter sounds and reading comprehension). At the start of the CBE programme, 11% of children in the estimation sample were unable to identify any letters and 61% were unable to answer a single reading comprehension question. By

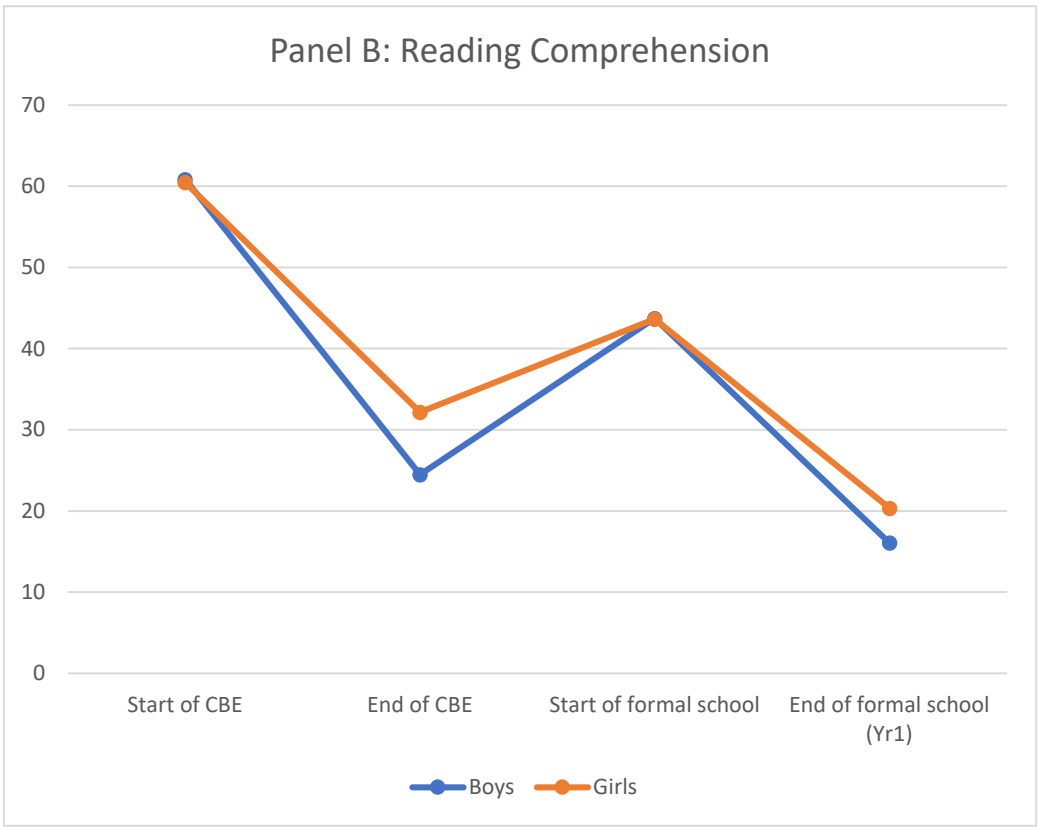
the end of the CBE programme, the proportion of nonperformers was reduced to 4.5% for letters and to 29% for comprehension. This constitutes an improvement of more than 50% for both subtasks. However, during the period between completing the CBE programme and starting government school, much of the gains had been eroded. The proportion of nonperformers in letters increased to 9% and those who were unable to comprehend what they read increased to 44%.

While reductions in letter sound nonperformers followed the same trajectory for boys and girls during the CBE programme (Figure 1, Panel A), the loss during transition was slightly worse for boys. An estimate of the unconditional learning loss in zero scores for letter sound identification for boys is 7.2% (standard error 2.2%; p-value < 0.01) and for girls is 5.1% (standard error 1.8%; p-value < 0.01). In terms of reading comprehension, the unconditional learning loss for boys is 20.7% (standard error 2.5%; p-value<0.01) whereas for girls is only 12.9% (standard error 3.6%; p-value<0.01).

In order to assess the magnitude of these learning losses for boys and girls, we compare them to their respective learning gains in each of these subtasks during the CBE programme. For instance, both boys and girls in the CBE programme made improvements in letter sound identification by reducing their zero scores by an average of about 8%. However, during the transition period boys lost about 89% of this improvement whilst girls lost about 56%, which means boys learning loss was worse than girls. Similarly, during the CBE programme, boys improved their reading comprehension by lowering their zero scores by 39%. Girls also saw an improvement of 32%. During the transition period, however, boys lost about 52% of the gains they had made whereas girls only lost about 42% of their gains. In other words, boys seem to lose more of their gains in letter sounds and reading comprehension during transition than girls.

Figure 1: Proportion of zero scores in literacy subtasks over time





There are two important findings to highlight. First, learning loss during school closure is higher for more basic literacy skills, in this case letter sound identification. Secondly, girls retain more literacy during time out of school in both letter sound identification and reading comprehension.

The role of Mother Tongue Education

In this section, we build on the overall estimates of learning loss during school closure in order to determine the impact of language-related factors on relative losses in zero scores. More specifically, we have included three factors as predictors of loss in our difference-in-difference model: student's preference for learning in mother tongue, whether or not the teacher's language was easy to understand, and whether or not the teacher used the same language as the child. The results for two models (using zero scores in letter identification and reading comprehension as dependent variables) estimated for all children as well as by gender, are displayed in Table 2. The first result to highlight is the conditional average learning loss for children who did not prefer to learn in mother tongue, who did not find the language used by the teacher easy to understand and who reported that the language used by the teacher was not the same to theirs. These children have an estimated 6.4% increase in zero scores for letter sound identification and 35.6% for reading comprehension. Here we notice significant differences by gender, with boys appearing more disadvantaged in terms of the simpler task of non-performance in letter sounds, while girls are more disadvantaged in the higher-skilled task of reading comprehension. Specifically, for boys, there is an estimated 10.1% increase in the proportion of nonperformers in letter sounds, whereas for girls it was 3.7%. For reading comprehension the average learning loss for boys was 30.2% whereas for girls it was 39.1%.[ii]

Table 2: Learning loss during transition time: relative zero scores in literacy by language (by gender)

	ALL		Boys		Girls	
VARIABLES	Letter Identification [1]	Reading Comprehension [2]	Letter Identification [3]	Reading Comprehension [4]	Letter Identification [5]	Reading Comprehension [6]
Average learning loss (no preference for MT)	**6.419****	**35.621*****	10.103**	30.233***	3.767	39.117***
	(2.866)	**(5.192)**	(4.066)	(8.216)	(3.902)	(6.779)
Prefer to learn in MT	0.192	6.697	0.443	-0.489	0.149	11.380**
	(1.954)	(4.085)	(2.725)	(6.173)	(2.849)	(5.605)
DID: prefer MT relative to no MT	2.554	**-15.754*****	-2.987	-11.013	7.077	**-19.183****
	(3.397)	**(5.956)**	(5.136)	(8.985)	(4.409)	**(8.043)**
Language use by teacher easy to understand	0.316	4.917	1.043	2.628	-0.484	7.529
	(2.179)	(4.367)	(3.581)	(6.292)	(2.502)	(6.045)
DID: Language used by teacher easy relative to not	-0.604	**-15.147****	1.945	-3.376	-3.075	**-25.066*****
	(3.361)	**(5.973)**	(5.327)	(9.005)	(4.143)	**(7.992)**
Language use by teacher same as child	2.567	10.804**	1.722	6.524	4.514	13.694**
	(2.281)	(4.393)	(3.446)	(6.343)	(3.014)	(6.065)
DID: Same language used by teacher relative to not	**-7.014****	-7.095	-8.024	-5.717	-6.263	-8.844
	(3.301)	(6.015)	(4.980)	(8.941)	(4.364)	(8.153)
Controls home support and resources	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	20.073***	59.953***	26.692**	65.841***	12.811	61.659***
	(7.263)	(13.706)	(10.542)	(19.710)	(10.324)	(18.748)
Observations	1,117	1,117	503	503	614	614
R-squared	0.091	0.187	0.115	0.214	0.104	0.193

Note: Robust standard errors in parentheses. DID (difference-in-difference parameters) indicates the *relative loss* within factors. Controls for home learning support and resources and other controls included in the model (results not shown here). Asterisks *, **, *** indicate statistical significance at 10, 5, and 1% level. Source: CBE Monitoring and Evaluation 2016-2018.

Regarding our difference-in-difference estimates (bolded variables in Tables 2 to 4), we find that several language factors significantly impact changes in relative learning loss. Overall, the impacts tended to be larger for the more difficult task of reading comprehension than letter identification. First, children who prefer to learn in mother tongue had a smaller learning loss in reading comprehension (16% lower zero scores) relative to those who do not prefer to learn in their mother tongue. Second, children who reported that the language used by the teacher was easy to understand fared better than those who reported difficulties understanding the language used by their teacher – their zero scores in reading comprehension were about 15% lower. With regard to letter identification, children who reported that the language used by the teacher was the same as their own language had a lower learning loss (proportion of zero scores was about 7% lower) during their time at home relative to those who reported their teacher used a language different from their mother tongue. However, we notice that all these results are particularly significant for girls. In reading comprehension, girls who prefer to learn in mother tongue were able to lower their zero scores by about 19% and those who found the language of the teacher easier (i.e. similar to mother tongue) were able to lower their zero scores by about 25%. Interestingly, for boys, we did not find significant differences in reading comprehension zero scores as a result of their reports on language factors. This may be an indication of the lesser attention girls receive in class as qualitative evidence from classroom observations suggest (Akyeampong et al. 2018).

The Role of Home Learning Support and Resources

In order to respond to the question of the role of home learning support and resources in mitigating learning loss, we estimated a model including support for learning at home, as well as availability of learning resources at home (for five separate indicators, as shown in Table 3). The conditional average learning loss for children who reported no learning support or activities at home, was a 12.6% increase in zero scores for letter identification and 26.5% increase in zero scores for reading comprehension. There are again significant gender differences, whereby boys who reported no learning support or activities at home have a conditional average learning loss in letter sound identification of 19.7% (relative to other boys) and girls only 6.3% (relative to other girls). For reading comprehension the pattern is reversed. The conditional

average learning loss for boys without any home support or learning activities at home is 20.8% (relative to other boys) and for girls 29.4% (relative to other girls).

We did not find any relative differences in learning losses for children who reported learning activities or home support in the overall sample (Table 3, Column 1). However, analysis by gender shows that boys who reported having access to learning activities at home had a smaller learning loss in letter sound identification during the transition period at home, relative to boys who did not report have access to learning activities at home.

For reading comprehension, several significant factors emerged. First, boys and girls who asked adults for help with schoolwork at home had a smaller increase in zero scores for reading comprehension relative to those who did not ask for help. The relative difference is estimated at 26% for all children, 23% for boys and 27% for girls. Second, children who reported having access to reading, writing and counting activities at home also had a lower learning loss in reading comprehension during the transition, with a 17.7% relative reduction in zero scores. We found that this result holds only for boys, whereby boys who had access to learning activities at home had a lower learning loss in reading comprehension (22.5%) relative to other boys who did not have access to these activities at home. This was not the case for girls.

Table 3: Learning loss during transition time: relative zero scores in literacy by home learning support and resources (by gender)

	ALL		Boys		Girls	
VARIABLES	Letter Identification [1]	Reading Comprehension [2]	Letter Identification [3]	Reading Comprehension [4]	Letter Identification [5]	Reading Comprehension [6]
Average learning loss (no time; no help; no learning activities or resources)	12.612***	26.458***	19.740***	20.805*	6.292	29.408***
	(4.601)	(7.464)	(6.954)	(11.507)	(6.034)	(10.157)
Time to study at home	1.239	-8.945**	5.620***	-12.868*	-1.192	-6.889
	(1.843)	(4.354)	(2.096)	(6.680)	(2.670)	(5.955)
DID: time to study relative to no time	0.132	9.692	-3.257	13.015	3.140	7.043
	(3.182)	(6.060)	(4.179)	(9.232)	(4.625)	(8.246)
Ask for help most of the times	-1.324	2.552	0.336	3.224	-2.777	1.187
	(2.123)	(4.644)	(4.181)	(6.604)	(2.174)	(6.783)
DID: most times ask relative to sometimes/never ask	-0.886	**-26.128*** **	-0.532	**-23.085*** **	-1.813	**-27.332*** **
	(3.369)	**(5.934)**	(5.550)	**(8.461)**	(4.172)	**(8.488)**
Literacy/numeracy activities	4.017*	12.992**	5.753*	18.218**	3.093	10.044
	(2.079)	(5.771)	(3.239)	(7.141)	(2.742)	(8.618)
DID: Learning activities relative to none	-4.754	**-17.718****	**-15.489****	**-22.516****	4.789	-13.519
	(3.929)	**(7.702)**	**(6.061)**	**(10.596)**	(4.843)	(10.881)
Reading materials	-0.982	-0.613	0.932	-6.728	-2.711	3.201
	(2.083)	(5.724)	(3.026)	(7.274)	(2.675)	(8.468)
DID: Reading materials relative to none	-3.368	0.386	1.260	3.682	-8.022	-2.806
	(3.960)	(7.742)	(5.949)	(10.887)	(5.025)	(10.790)
TV/Radio/Mobile	-3.932	-2.449	-7.121	-4.566	-1.791	-0.589
	(2.678)	(4.639)	(4.529)	(7.004)	(3.137)	(6.407)
DID: TV, Radio or Mobile at home relative to none	-2.291	-1.611	-3.471	6.991	-0.868	-7.409
	(3.985)	(6.339)	(6.613)	(9.446)	(4.835)	(8.773)
Controls for language	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	17.155**	64.742***	21.983**	67.981***	11.580	69.721***
	(7.295)	(13.809)	(10.612)	(19.685)	(10.333)	(19.185)
Observations	1,117	1,117	503	503	614	614
R-squared	0.092	0.193	0.130	0.235	0.100	0.181

Note: Robust standard errors in parentheses. DID (difference-in-difference parameters) indicates the *relative loss* within factors. Controls for language and other controls included in the model (results not shown here). Asterisks *, **, *** indicate statistical significance at 10, 5, and 1% level. Source: CBE Monitoring and Evaluation 2016-2018.

Combining Factors

Our final model brings together factors related to mother tongue language, home learning support and resources. Since we must maintain a minimum cell count for estimation of these models with interactions, we only include here the interactions of the factors which were significant in prior estimates, as reported above. Table 4 shows the average learning loss for children who did not prefer to learn in mother tongue, did not find the language used by the teacher easy to understand, reported that the language used by the teacher was not the same to theirs, did not have support from adults with learning and did not have access to learning materials at home. For these children the average learning loss during the transition is estimated to be a 12.8% increased proportion of zero scores for letter sound identification (25.4% for boys and only 3.3% for girls) and 46.8% for reading comprehension (40.3% for boys and 50.5% for girls). These are the largest estimates of any model thus far.

Overall, estimates from the combined model are similar to those obtained from separate models, with one interesting difference by gender. While there are slight changes in the magnitude of some learning loss estimates, the implications remain virtually unchanged when the language factors are estimated with learning support and activities at home for boys. There were no relative differences in learning loss during the transition according to language preference for boys. We found that boys who reported having support or learning activities at home, achieved reductions in learning loss for reading comprehension by 22.9% and 20.1%, respectively. In terms of letter identification, boys with learning activities at home showed a large reduction of 16.4%. For all these parameters, the size of the estimated relative learning loss is substantial if one considers the scale of zero scores presented in Figure 1.

For girls, both factors on language that were significant predictors of relative learning loss for reading comprehension in the prior models, remained significant in the combined model (with only slightly smaller magnitudes). Girls who preferred mother tongue language instruction had a 17.1% reduction in zero scores relative to girls who did not prefer mother tongue. Similarly, girls who found the language used by the teacher relatively easy to understand had 19.6% reduction in zero scores relative to girls who did not find the language used by the teachers easy to understand. For home support, we continued to find that girls who were able to get support at home had

significant reductions in zero scores relative to girls who did not have support at home (20.6%). However, for learning resources, we found that girls who had access to learning activities at home had a relatively smaller learning loss in reading comprehension (18.4%) compared with girls who did not have access to these activities at home.

Table 4: Learning loss during transition time: relative zero scores in literacy using parsimonious model (by gender)

	ALL		Boys		Girls	
	Letter Identification	Reading Comprehension	Letter Identification	Reading Comprehension	Letter Identification	Reading Comprehension
VARIABLES	[1]	[2]	[3]	[4]	[5]	[6]
Average learning loss	12.775***	46.821***	25.364***	40.267***	3.298	50.547***
	(4.692)	(7.915)	(7.302)	(12.884)	(5.956)	(10.388)
Prefer to learn in MT	0.445	6.946*	1.359	1.076	-0.045	10.640*
	(1.949)	(4.131)	(2.690)	(6.242)	(2.892)	(5.664)
DID: prefer MT relative to no MT	2.130	**-15.715****	-4.822	-13.722	7.532	**-17.070****
	(3.566)	**(6.147)**	(5.243)	(9.360)	(4.815)	**(8.281)**
Language use by teacher easy to understand	0.190	3.190	1.902	2.441	-0.811	4.800
	(2.172)	(4.308)	(3.563)	(6.207)	(2.520)	(6.003)
DID: Language used by teacher easy relative to not	-0.283	**-11.757****	0.309	-3.196	-2.472	**-19.639****
	(3.330)	**(5.964)**	(5.229)	(9.035)	(4.230)	**(8.056)**
Language use by teacher same as child	2.735	11.652***	1.240	5.609	4.703	15.763***
	(2.288)	(4.335)	(3.397)	(6.245)	(3.069)	(6.047)
DID: Same language used by teacher relative to not	**-7.492****	-9.413	-7.330	-4.721	-6.663	-13.339
	(3.311)	(6.017)	(4.781)	(9.047)	(4.582)	(8.183)
Ask for help most of the times	-1.133	0.418	-0.067	3.187	-2.089	-2.363
	(2.143)	(4.649)	(4.135)	(6.688)	(2.274)	(6.561)
DID: most times ask relative to sometimes/never ask	-1.402	**-21.914*****	0.219	**-22.865*****	-3.458	**-20.570****
	(3.461)	**(6.121)**	(5.473)	**(8.636)**	(4.485)	**(8.660)**
Literacy/numeracy activities	5.400**	14.198***	6.224*	17.079**	5.728*	12.706*
	(2.260)	(4.904)	(3.626)	(6.652)	(2.967)	(7.050)
DID: Learning activities relative to none	**-7.563****	**-20.030*****	**-16.424*****	**-20.139****	-0.319	**-18.398****
	(3.488)	**(5.629)**	**(5.497)**	**(8.250)**	(4.548)	**(7.872)**
Controls time to study, books at home, tv, radio, mobile	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	17.135**	54.654***	19.020*	58.407***	13.284	58.420***
	(7.355)	(13.819)	(10.813)	(19.696)	(10.389)	(19.187)
Observations	1,117	1,117	503	503	614	614
R-squared	0.096	0.209	0.136	0.239	0.105	0.210

Note: Robust standard errors in parentheses. DID (difference-in-difference parameters) indicates the *relative loss* within factors. Controls for time to study, books, tv, radio and mobile and other controls included in the model (results not shown here). Asterisks *, **, *** indicate statistical significance at 10, 5, and 1% level. Source: CBE Monitoring and Evaluation 2016-2018.

Discussion and Conclusions

We are living in unprecedented times. Governments and school systems across the globe are faced with the task of providing educational opportunities to more than a billion children impacted by COVID-19-related school closures. Even as schools reopen, most will continue to encounter new obstacles resulting from the need to incorporate social distancing and additional safety measures in systems that are designed for face-to-face teaching in typically crowded classrooms, hallways, and school grounds. As a result, many education systems are incorporating remote/distance learning to a larger degree, consequently requiring increased levels of support from parents and caregivers. However, there is little empirical evidence on the factors that may lead to differential effects on learning among students who will have to rely more heavily on parental support and teacher-free instruction than ever before. In this paper, we address this gap by examining preferences for language of instruction, home learning support, and home learning activities on learning among Ghanaian students during a 3-month summer school closure period.

Overall, we found that large proportions of disadvantaged students who had attained foundational reading skills during the CBE programme, reverted to being nonperformers during their time away from school. Proportionally, we found that children unable to master the most basic of these skills, in our case letter sound identification, are more likely to lose these skills. Children who master the harder skills, for instance reading comprehension, are proportionally less likely to lose these skills, perhaps as they are perhaps able to practice reading at home or in their communities. This result is consistent with previous studies on learning loss during school holidays which point to the larger skill loss for children who have not yet mastered foundational literacy skills (Education Endowment Foundation, 2020).

Reverting to being nonperformers during their time away from school was more pronounced for boys than for girls. Yet, when we introduced the role of preferences for language of instruction as reported by the students in our study, as well as the support they received at home with learning, the relative magnitude of learning losses magnified particularly for girls. For girls, significant relative reductions in loss were

driven by those who preferred to learn in their mother tongue, those who found the language used by the teacher easier to understand, those who consistently asked for help with work at home, and finally those with access to learning activities at home. For boys, we did not find any of their views on language preference and usage by the teacher associated with reductions in their learning loss. However, we found significant reductions in loss driven by home support and access to learning activities at home.

We may infer some of the reasons for relative differences in literacy loss between boys and girls, particularly with respect to language. First, it is interesting to point out that we estimate a larger literacy loss for boys during the transition period, but that they bounce back better than girls after this transition period. This result is consistent with Carter et al. (2020a) who demonstrated that low achieving girls are at a particular risk of remaining low achievers, whereas low achieving boys are more likely to catch up. There are differences between boys and girls in their engagement with work activities outside of the home (with boys being more likely to work outside of the house) – which may explain their higher learning loss (Higgins and Akyeampong, 2018).

Recent studies have suggested effective ways to stem the learning loss using a variety of resources including digital technologies and radio (Azevedo et al., 2020; Alasuutari, 2020). However, there is also recognition that many of these are likely to increase inequality in learning continuity because of inequitable access to these resources (UNICEF, 2020). On the other hand, resources in the form of print material to both children and households may offer a more equitable opportunity to ensure learning continuity even for the poorest households with limited literacy (Mundy and Hares, 2020).

Our results confirm what many other recent studies suggest in terms of learning losses during school closures. Learning loss due to the time out of school is likely to be significant particularly for children from poor and disadvantaged backgrounds (Wagner, Wolf, and Boruch, 2018). For these children the learning loss could increase their risk of dropping out of school (Selbervik, 2020). In addition, there can be cumulative future effects from school closures including lower chances of continuing in education to upper secondary and tertiary levels, reduced earnings and labour market potential as well as future impacts of health and wellbeing (Mundy and Hares,

2020). In effect, long school closures pose a serious risk to reducing inter-generational poverty.

COVID-19 has raised the importance of ensuring that education systems are resilient to shocks that disrupt schooling. We need to pay closer attention to policies and practices that can protect poor and marginalised children from learning loss, whether in school or during long periods when they are out of school. COVID-19 has exposed that schools can be levellers and that an over-reliance on home environments and support for learning will likely disadvantage some learners more than others. The gender of a child becomes even more crucial during school closures because of cultural and economic gender biases which lead to unequal opportunities to effective learning. As our results have demonstrated, widening literacy gaps could be expected for girls who do not receive the support in a language that they understand or who do not have the resources, support or activities at home to continue their education. These are girls who are likely to fall behind, and potentially make the slowest recovery. Boys, on the other hand, have larger losses in literacy and other research have shown that they are likely to bounce back more rapidly than girls (Carter et al., 2020a). Yet, widening gaps in foundational literacy are not found for boys, for whom resources and support at home also matters for literacy retention. This suggests that schools and teachers must pay closer attention to recovering children's learning losses, ensure that language of instruction is not a barrier to this recovery, and considering the interplay of gender, language and household dynamics in the learning recovery of all children.

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Endnotes

[i] DFID was merged with the UK Foreign and Commonwealth Office from 2nd September 2020 to become the Foreign, Commonwealth and Development Office (FCDO)

[ii] It is important to recall that these are boys and girls who reported challenges with mother tongue and not the average level which is reported in the previous section. It is also important to highlight that these are conditional averages whereas in the previous section we presented unconditional trajectories.

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