Unpacking the Relationship Between Components of Food-for-Education Programming and Literacy Skills

Uttara Balakrishnan, Michaela Gulemetova, Daniel Zaas, and Adam Taube, American Institutes for Research (AIR)

Introduction

Although children in the developing world are enrolling in school at historically high levels, improvements in children's literacy skills are still lagging. Half of all children in low- and middle-income countries (LMICs) experience "learning poverty," which is the inability to read and comprehend age-appropriate text by age 10 (Azevedo et al., 2021; World Bank, 2019). This number is expected to grow to 70% of all children in the coming years due to the long-lasting effects of the COVID-19 pandemic (World Bank, 2022). Several evidence syntheses have examined the effectiveness of school-based interventions to improve children's literacy skills and found that multifaceted programs are the most promising approach for improving learning (Evans & Acosta, 2021; McEwan, 2015). Interventions that use structured pedagogy (which typically provides lesson plans and training for teachers along with new materials for students) or mother tongue instruction and a variety of teacher coaching programs have been shown to have positive impacts on literacy skills (Brunette et al., 2019; Dubeck et al., 2015; Evans & Acosta, 2021; Graham & Kelly, 2018; McEwan, 2015; Nag et al., 2019; Piper et al., 2018). Other studies have found that providing instructional materials, teacher training, classroom engagement, and technology-in-education programming can have positive impacts (Conn, 2017; Kim et al., 2020; McEwan, 2015). School feeding and nutrition-based programs have also been shown to have small positive effects on learning outcomes (McEwan, 2015). While early-grade literacy interventions have proliferated in LMICs as a possible solution to improve literacy in LMICs, major questions remain about *which components* of these literacy interventions are most effective in improving children's literacy skills.

This study contributes to the evidence base on effective literacy interventions by examining the relationship between the literacy components of McGovern Dole (MGD) Food-for-Education (FFE) programming and children's literacy skills. Annually, the U.S. Department of Agriculture (USDA) provides nearly $250 million in funds for MGD FFE projects worldwide to reduce hunger and improve the literacy skills of school-age children, with a specific focus on girls. To do so, MGD projects provide school meals and a host of literacy, nutrition, and health

interventions. The literacy interventions in each MGD FFE project offer a range of components tailored to the specific country context, including teacher trainings, school libraries, and activities to reduce barriers to teacher attendance. These multifaceted MGD FFE projects aim to (a) increase children's nutrition, school attendance, and classroom attentiveness through the provision of school meals and (b) improve the quality of literacy instruction by giving teachers the pedagogical tools and materials they need, with the ultimate goal of improving children's food security and literacy skills.

This research brief examines the MGD FFE literacy program components that are associated with improved literacy skills. The brief focuses on four recent MGD FFE projects that have shown significant positive impacts on early grade literacy skills in Liberia, Mali, the Lao People's Democratic Republic (Lao PDR; formerly known as Laos), and Cote d'Ivoire.[1] By examining similar (i.e., 5-year, large-scale) programs across four countries, this brief attempts to understand which findings may be universal (if any), and which are context-specific. These insights will enhance the available research on the relationship between literacy activities in MGD FFE programming and literacy skills and help inform future project designs. Country-specific findings will aid in tailoring future interventions to local contexts, both within and across countries, while universal lessons can provide policymakers with useful recommendations about food-for-education programming to improve literacy across settings.

Description of MGD FFE Interventions

Exhibit 1 presents an overview of the MGD FFE intervention in each of the four countries. The core component in all MGD FFE projects is the provision of school meals for primary school students, which is intended to improve attendance and attentiveness, and which, in turn, is likely to create the right opportunity to learn and support reading outcomes (Alderman et al., 2012; Crea et al., 2021). Nutrition programming in all MGD FFE projects is often accompanied by deworming, nutritional supplements, and trainings on nutrition, food preparation, and food storage for canteen managers. In addition, all MGD FFE programs include literacy components such as the provision of teaching and learning materials and training for teachers, directors, and parent associations. The theory of change that is the foundation of the MGD FFE projects links the provision of school feeding and the literacy activities to improved food security and learning. AIR has previously evaluated the separate impacts of school

[1] AIR evaluated each MGD FFE project using a rigorous quasi-experimental design, which measured the overall impact of the MGD FFE project on literacy outcomes from baseline to follow-up. Each evaluation included a treatment group of students who received the MGD school feeding program, either alone or combined with literacy interventions, and a comparison group of students who did not receive any interventions.

feeding programs and the combination of school feeding programs and literacy activities in each country using rigorous quasi-experimental methods.[2] Building on that work, this study attempts to unpack the "black box" of literacy activities and examine their association with literacy skills based on the critical role these activities play in influencing literacy skills in LMICs. **Exhibit 2** details similarities and differences in the literacy components across the four programs discussed in this brief.

Exhibit 1. MGD FFE Intervention by Country

Cote d'Ivoire (2015–2021)

Main Implementing Partner: World Food Programme and AVSI

Beneficiaries: 613 schools in 7 regions and 132,896 beneficiaries (129,000 students)

Program Overview: The "Integrated School Feeding and Literacy Program" included the following activities:

- Provision of mobile libraries, literacy toolkits, reading boards with letters and words, dictionaries, and more
- Teacher training through a Training of Teachers model
- Distribution of the government curriculum
- Roundtable discussions with government officials
- Community engagement including reading promotion events, sensitization sessions, and the establishment of book clubs
- School meals and take-home rations for girls
- Food preparation and storage equipment

Liberia (2017–2022)

Main Implementing Partner: Save the Children and Mercy Corps

Beneficiaries: 132,780 beneficiaries including 60,164 students in 220 schools in 4 counties

Program Overview: Activities under the Liberia Empowerment Through Attendance, Reading, and Nutrition (LEARN) program include:

- Production of books and reading materials
- Establishment of libraries
- Training for summer reading camps
- Caregiver engagement through the "I Help my Child to Learn" tool, Literacy Champion program, outreach to parent associations, and radio jingles that promote the importance of education
- Provision of school meals and take-home rations for girls
- Build/rehabilitate storerooms, kitchens, stoves, and latrines

Mali (2015–2020)

Main Implementing Partners: Catholic Relief Services and Education Development Center

Beneficiaries: 74,006 school-age children in 291 schools in 2 regions

Program Overview: The McGovern-Dole Program in Mali included:

- Teacher and school administrator trainings on the "Balanced Literacy Approach"
- The allocation of literacy materials including radios, books, games, and alphabet boards
- The promotion of the importance of education for girls
- Engagement with school management committees
- Ongoing teacher support from pedagogical advisors
- Teacher recognition activities
- Capacity-building activities with local and national stakeholders to strengthen their ability to conduct monitoring and evaluation work
- School meals and take-home rations for Grade 5 and 6 students in schools with high attendance rates

Lao PDR (2016–2021)

Main Implementing Partners: Catholic Relief Services (CRS) and Save the Children

Beneficiaries: 77,000 pre-primary and primary students in 350 schools in 7 districts

Program Overview: Through the "Learning and Engaging All in Primary School" (LEAPS) program, CRS facilitated:

- Teacher and school administrator trainings on literacy instruction and inclusive education
- Teacher recognition activities
- Pedagogical support and coaching visits conducted by government staff
- The provision of resources and supplemental materials called "School Kits"
- Community engagement through reading camps and the development of village education development committees
- A feasibility assessment for inclusive education programming
- School meals and take-home rations for cooks and storekeepers
- Establishment of school gardens

[2] The original AIR evaluations of the MGD projects were the Lao PDR LEAPS II project impact evaluation: https://pdf.usaid.gov/pdf_docs/PA00WNPK.pdf; the Liberia LEARN Impact Evaluation: https://www.air.org/project/liberia-empowerment-through-attendance-reading-and-nutrition-learn-and-learn-ii; the Cote d'Ivoire final evaluation of the Child Nutrition Program: https://pdf.usaid.gov/pdf_docs/PA00ZJZ2.pdf; and the Mali final evaluation: https://www.air.org/project/usda-mcgovern-dole-international-food-education-and-child-nutrition-program-phase-iii-mali.

Exhibit 2. MGD FFE Literacy Components Across Lao PDR, Liberia, Cote d'Ivoire, and Mali

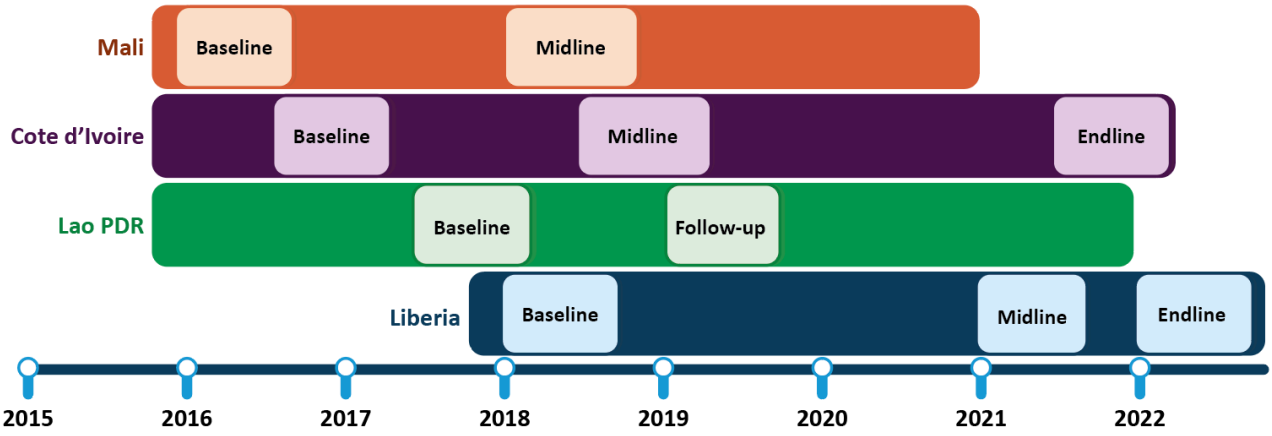
Components	Details/Description	Lao PDR	Liberia	Cote d'Ivoire	Mali
Teacher training	Training on literacy instruction and/or classroom management	✓	✓	✓	✓
Training for administrators and government officials	Training on literacy instruction and/or how to train teachers on the topic	✓	✓	✓	✓
Support from pedagogical trainers	Support for teachers provided by pedagogical advisors or master trainers	✓	✓	✓	✓
Teacher motivation	Activities aimed at motivating teachers and/or recognizing teacher accomplishments (e.g., merit certificates)	✓	✓	✓	✓
Teacher attendance	Activities targeted at reducing barriers to teacher attendance	✓		✓	
Extracurricular and community reading events	Organizing events or activities targeting community members outside of the school setting (e.g., reading clubs, camps, tutoring events)	✓	✓		✓
Capacity strengthening for monitoring and assessment	Working with local, regional, or national administrators around strategies to monitor and assess student literacy	✓			✓
Advocacy—teacher training	Advocating the government for changes to teacher training systems and/or resources				✓
Inclusive education	Training and/or an explicit focus on inclusive education techniques to work with children with disabilities	✓			
Provision of literacy materials	Distributing materials including books, literacy posters, and/or flash cards	✓	✓	✓	✓
Materials by local authors	Working with local authors and/or illustrators to produce books and supplemental materials	✓		✓	
Engagement with school stakeholder groups	Working with parent teacher associations and/or school management committees	✓	✓	✓	✓
Engagement with caregiver groups	Working with caregivers around literacy activities (e.g., sensitization, resources to promote literacy at home)	✓	✓		✓
Radio programs	Producing radio programs to promote literacy		✓	✓	✓

Methodology

Research question. This study seeks to determine which of the literacy components in the MGD FFE programs are associated with improved literacy skills in children. To address this research question, in each country, we restricted the sample to students who received the combined intervention of school feeding and literacy interventions. The total sample size of students in each country varied and is described in detail below. We then ran ordinary least squares regression on each sample to understand the relationship between each specific literacy component and literacy outcomes. In each regression, the independent variable was the specific literacy component being examined (e.g., teacher training, having books to borrow, etc.) and the dependent variable was the country-specific literacy skill, with a separate regression estimated for each literacy component. We ran regressions separately for each country.

Time frame. Exhibit 3 shows the implementation period of each MGD FFE project and the timeline for data collection for the impact evaluation conducted by AIR. Where available, using baseline, midline, and endline data allowed us to examine the 2-year and 4-year relationships between the literacy intervention components and literacy skills in each country.[3]

Exhibit 3. Project Implementation and Data Collection Timeline for Each Country



Data sources and sample. We used student reading assessment scores and survey data from students, teachers, and school directors as well as classroom observations, all previously collected by AIR as part of the evaluations of each MGD FFE project. To increase the comparability and consistency of our

[3] In Lao PDR, there were only two rounds of data collection—baseline and follow-up—which only allowed us to measure 2-year impacts. In Cote d'Ivoire, Mali, and Liberia, we estimated both 2-year and 4-year impacts.

approach, we restricted student samples to Grade 2 students in each country.[4] **Exhibit 4** presents the sample sizes included in this analysis for each study and each round of data collection.

Exhibit 4. Sample Sizes of Students Used in Analysis

Data collection round	Cote d'Ivoire	Lao PDR	Liberia	Mali
Baseline	199	1,582	468	1,897
Midline/Follow-up	235	1,161	492	1,883
Endline	244	n/a	477	n/a

Note. n/a = not applicable.

Outcome variables. We used two early grade literacy skills as the key outcomes of interest: (1) oral language skills and decoding and (2) reading comprehension skills; this approach was based on the Cognitive Foundations Framework (Hoover & Tunmer, 2020). We acknowledge that reading comprehension and decoding do not necessarily align to the same cognitive construct; however, these two skills were the only ones selected due to the limited set of subskills examined in the assessments. As two different reading assessments were used to assess varying literacy skills, the definition of the outcome measure varies by country and by skill type. **Exhibit 5** details this further.

Exhibit 5. Outcome Variables by Country

Country	Assessment	Outcome variable	Literacy skill
Cote d'Ivoire and Mali	ASER	• The test included 11 levels that corresponded to practical reading standards for each grade (i.e., A = identify letters; B = read simple sounds; C = read complex sounds; D = decode simple words; E = decode complex words; F = read simple sentences; G = read complex sentences; H = read simple stories; I = comprehend simple stories; J = read complex stories; K = comprehend complex stories). • The reading level for each student was converted to a score on a scale from 1 to 11 (*continuous measure*).	Decoding/ reading comprehension
Lao PDR	Modified EGRA	• Three subtests were used to create a continuous measure of oral language skills (*continuous measure*): – Expressive vocabulary (total number of animals and foods the child could name in Lao PDR) – Phonemic awareness (number of word pairs identified based on similar first letter sounds)	Oral language skills

[4] During each round of data collection, AIR surveyed students from several primary school grades as part of the MGD FFE evaluations; however, most impact evaluations focused on Grade 2 students. The exception was Lao PDR, where students were tracked from Grade 1 to Grade 2. In Liberia and Cote d'Ivoire, disruptions caused by COVID-19 forced AIR to collect data at the beginning of the following school year. To compensate for the lack of Grade 2 students at the end of their second year, Grade 3 students were surveyed and considered a good proxy for Grade 2 students given that they had yet to receive any of their Grade 3 education.

Country	Assessment	Outcome variable	Literacy skill
		– Listening comprehension (number of questions answered correctly by nonreaders)[a]	
		• Four subtests were used to create a continuous measure of decoding and reading comprehension skills (*continuous measure*): – Letter knowledge (number of letters and sounds known) – Word recognition (number of most-used words read correctly from leveled textbooks) – Word to picture matching (number of objects matched with their corresponding pictures) – Reading comprehension (number of questions answered correctly by readers)	Decoding/ reading comprehension
Liberia	Modified EGRA	• One subtest was used to create a continuous measure of oral language skills (*continuous measure*): – Listening comprehension (number of questions answered correctly by nonreaders)[b]	Oral language skills
		• Four subtests were used to create a continuous measure of decoding and reading comprehension skills (*continuous measure*): – Letter knowledge (number of letters/sounds known) – Word recognition (number of most-used words read correctly from leveled textbooks) – Invented words (number of invented words read correctly) – Reading comprehension (number of questions answered correctly by readers)	Decoding/ reading comprehension

Note. ASER = Annual Status of Education Report; EGRA = Early Grade Reading Assessment.
[a] Students were first classified as readers or nonreaders before the comprehension question. Students were asked to read a simple passage of text. If students could read at least 5 words of the passage within 30 seconds, they were considered a reader and received reading comprehension questions, else they were nonreaders and received listening comprehension questions.
[b] Similar to Lao PDR, in Liberia, students were first classified as readers or nonreaders before the comprehension question. Students were asked to read a simple passage of text. If students could read at least 5 words of the passage within 30 seconds, they were considered a reader and received reading comprehension questions, else they were nonreaders and received listening comprehension questions.

Explanatory variables. The explanatory variables are the different literacy activities in each country. Specifically, we developed a list of theory-driven constructs that served as a proxy for the literacy components in each country by creating comparable metrics using thematic buckets based on the measured information. In each country, we scanned the survey questionnaires from students, teachers, and school directors and the classroom observation protocols for items that captured aspects of the projects' literacy components.[5] We then grouped the items into thematic buckets based on the information being measured.[6] The team iteratively reviewed the definitions of the constructs to ensure

[5] The team also reviewed the instruments from each round of data collection with particular attention to any changes over time in the wording of survey items.
[6] We used both single and multiple survey items to form the construct in a particular country, so that each construct is comparable to other countries' definitions for a similar construct. For example, the construct defined as "someone read/told a story to the student at home" combines two questions that ask separately about families reading to and telling stories to children in the Lao PDR and Liberia surveys but one from the Cote d'Ivoire survey.

consistency and comparability across countries and to verify that all relevant information was captured. The final list of constructs was organized into (a) school literacy activities and (b) home literacy environment. The activities that fall under each of these constructs are listed in **Exhibit 6.** Full definitions are detailed in the appendix at the end of this brief.

Exhibit 6. Theory-Driven Constructs

School literacy activities	Home literacy environment
• Borrow books from school (C, La, Li) • Access to textbooks in the classroom (C, La, Li) • Access to cards/letters/objects to touch or handle (C, La) • Access to posters/illustrated reading boards (C, La) • Hear/read stories at school (La, Li, M) • Play educational games at school (C, M) • Ask questions about stories or lessons (La, M)	• Read outside of school (C, La, Li, M) • Access to books at home (C, La, Li) • Read to child (C, La, Li, M) • See a family member read at home (La, Li)

Note. C = Cote d'Ivoire ; La = Lao PDR ; Li = Liberia ; M = Mali.

Data analysis. After we defined the constructs, we explored descriptive statistics of the constructs to see if there was sufficient variation in the data such that the comparison of the constructs against the literacy skills outcomes would be meaningful. If the initial definition lacked variation, the team either removed that construct from the analysis or adjusted its definition.[7] We did this separately for each country. Next, we conducted regression analysis to examine the relationship between the construct (*explanatory variable*) and the literacy skill outcome, which was either oral language skills or decoding skills (*dependent variable*) depending on the country. We conducted a separate regression for each construct listed in **Exhibit 6,** in each country. We conducted the regression analyses for each round of available follow-up data (e.g., using midline data for relationships after 2 years and using endline data for relationships after 4 years of literacy interventions). Next, we present the associations between the constructs and the literacy skills outcome measures.

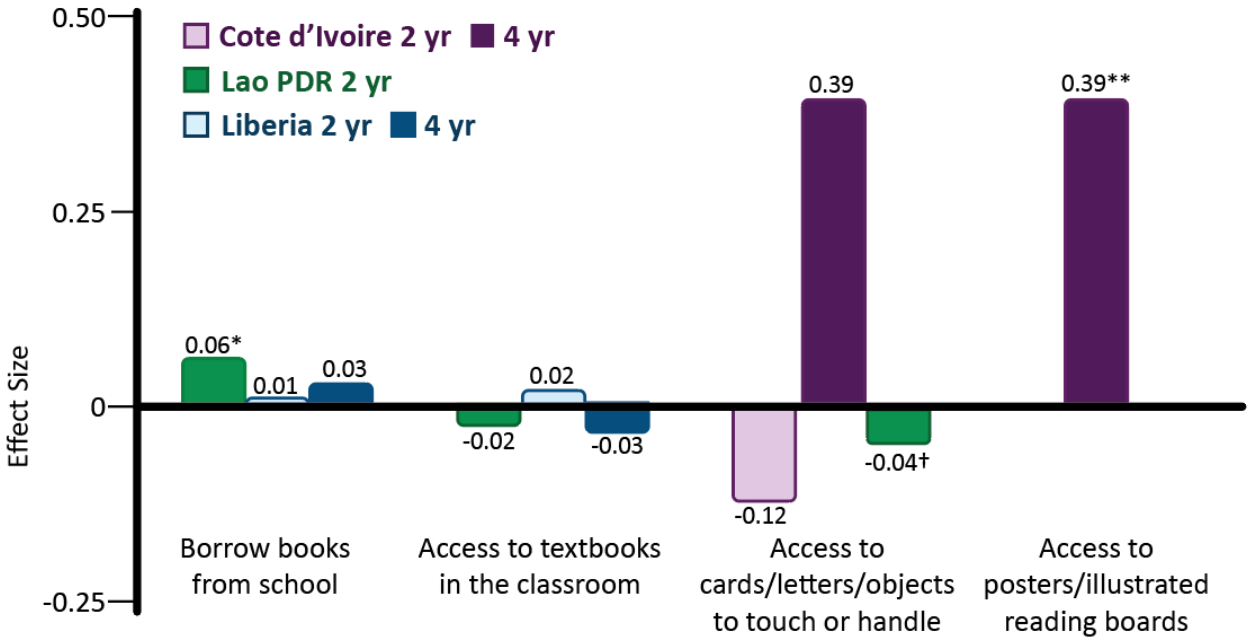
Findings

Having access to grade-appropriate books and reading materials at school matters. Students who borrowed children's books from schools was significantly correlated with higher decoding/reading comprehension skills in Lao PDR (**Exhibit 7**) and even more strongly correlated with oral language skills in both Lao PDR and Liberia (**Exhibit 8**). This finding is in line with prior research pointing to the importance of books and of exposure to a variety of reading materials (Kim et al., 2017). In contrast,

[7] For example, the "questions" variable, which captures whether teachers ask their students questions about stories or lessons, was defined originally as a binary variable coded as "1" if students reported being asked questions at least "rarely." However, this approach proved to have insufficient variation as almost all respondents fulfilled the condition. We re-coded this variable so that students needed to report being asked questions at least "sometimes," which provided more variation in the descriptive statistics.

Borkum and colleagues (2012) found that a school library program in India had no effect on oral language skills. We also found a negative correlation between access to textbooks in the classroom and oral language skills in Lao PDR. Although providing textbooks in environments where they are scarce can substantially increase students' test scores (Fehrler et al., 2009; Fuller, 1987), Glewwe and colleagues (2009) found that textbooks had no effect on average students but increased the reading scores of the highest-achieving students only; this was likely because textbooks were not written in a language that most students understood, which precluded many students from using textbooks effectively. Similarly, the mixed findings on the effectiveness of providing access to books could be related to the *quality* of the books and the language in which they are made accessible to students, with books written in one's mother tongue more likely to be associated with higher literacy skills (Knauer et al., 2020). In our study, we also found that materials beyond children's books and textbooks also matter, both for decoding/reading comprehension and for oral language acquisition, but only in certain contexts. For instance, having access to posters or illustrated reading boards was positively associated with higher decoding/reading comprehension skills in Cote d'Ivoire and with higher oral language skills in Lao PDR.

Exhibit 7. Relationship Between Instructional Materials at School and Decoding/Reading Comprehension Skills



†$p < 0.10$. *$p < 0.05$. **$p < 0.01$. ***$p < 0.001$. Not all levels of significance may be reflected in the exhibit.

Active, two-way student–teacher interaction is positively associated with higher oral language and decoding skills. Classroom interaction is a critical component in improving learning for students (Brown, 2000; Hurst et al., 2013). Brown (2001) argued that active two-way engagement (from teacher to student and from student to teacher) increases students' autonomy, confidence, and cooperation, and ultimately promotes critical thinking abilities. As shown in **Exhibit 9**, we found that teacher

engagement was mostly positively associated with higher decoding skills, with the strongest relationship found in Mali. There were also some positive correlations between teacher engagement and oral language skills (**Exhibit 10**); however, these relationships were much weaker. The type of interaction also matters. One-way interaction where students passively hear or read stories from the teacher was not associated with improved decoding or oral language skills and in fact, was marginally negatively associated with oral language skills in Lao PDR On the other hand, two-way interactions, where the teacher asks questions about stories read in class and students answer those questions, showed significant positive associations with both decoding/reading comprehension and oral language skills, as did playing educational games using the alphabet.

Exhibit 8. Relationship Between Instructional Materials at School and Oral Language Skills

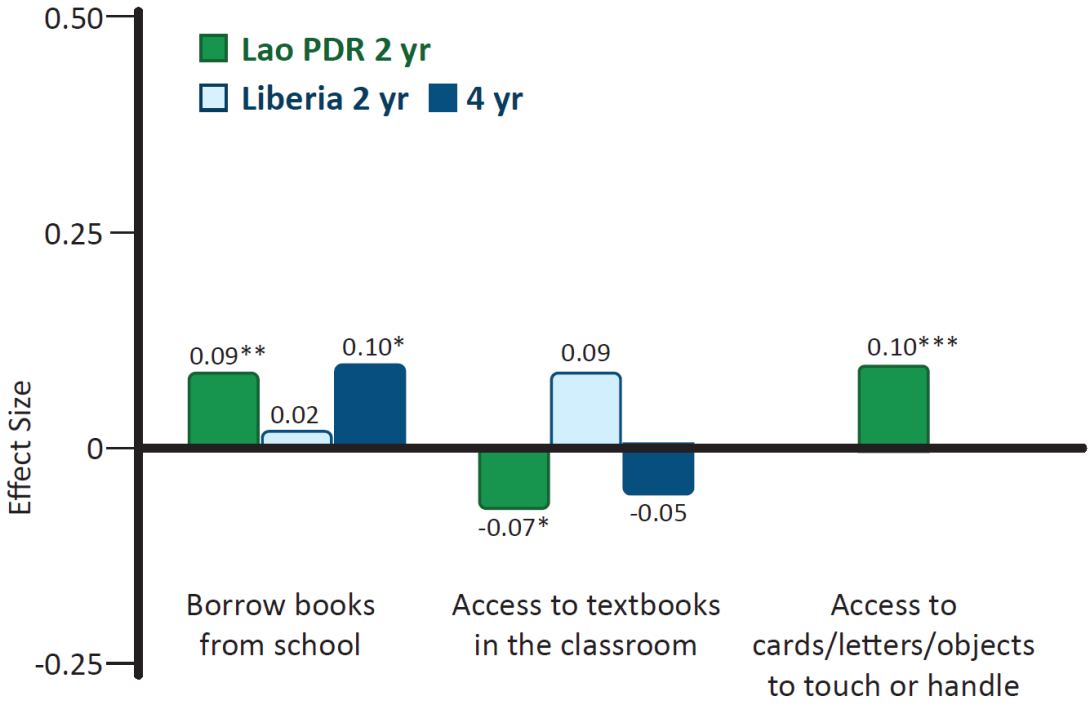


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Exhibit 9. Relationship Between Teacher Engagement and Decoding/Reading Comprehension Skills

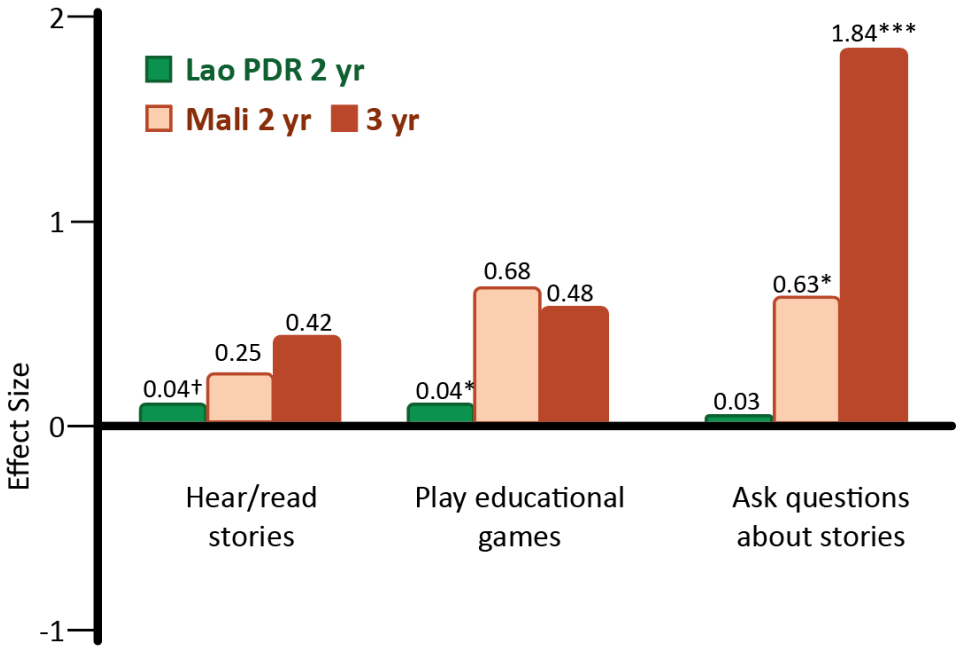

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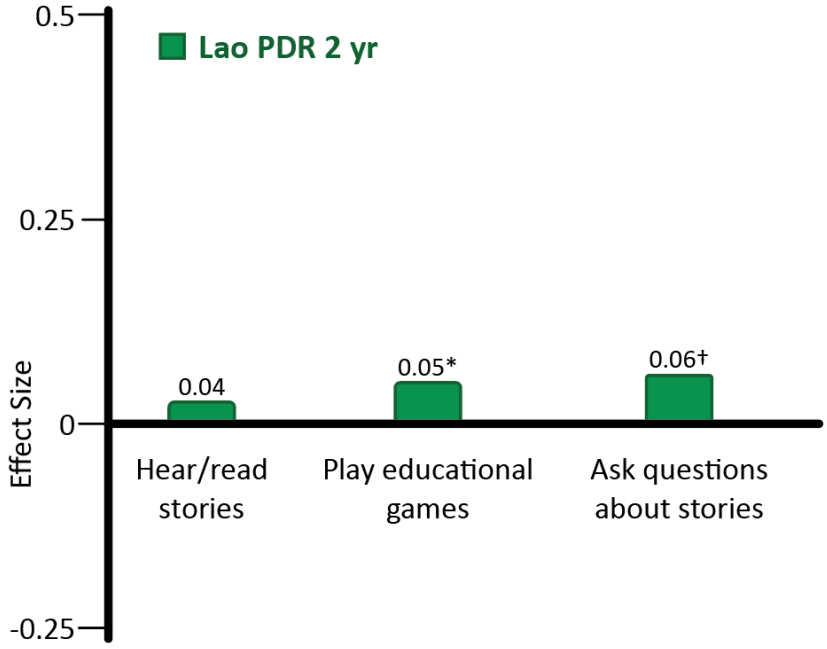
Exhibit 10. Relationship Between Teacher Engagement and Oral Language Skills



†$p < 0.10$. *$p < 0.05$. **$p < 0.01$. ***$p < 0.001$. Not all levels of significance may be reflected in the exhibit.

Children's home literacy environment is an important predictor of reading skills. Children who had a greater level of exposure to learning outside of school, specifically at home, were more likely to have more opportunities for literacy acquisition (Bracken & Fischel, 2008; Zwass, 2018). Further, there are different dimensions of home literacy—most often, "formal" (where print activities are the focus), and

"informal" (where parent-child engagement/talking is the focus) (Nag et al., 2019; Sénéchal & LeFevre, 2002, 2014). The former affects decoding/reading comprehension outcomes, and the latter affects oral language skills. Studies have also shown that when the language used in the home is different from the language used at school, it can have significant impacts on how much (and how) a child's home environment affects reading skills (Nag et al., 2019). In the MGD FFE programs examined in this study, we found significant positive associations between home literacy environment constructs and decoding/reading comprehension skills (**Exhibit 11**) and oral language skills (**Exhibit 12**) in all four countries. Having access to books at home was positively associated with higher decoding skills in Cote d'Ivoire and Lao PDR and with higher oral language skills in Lao PDR. This finding is in line with research from Zucker and colleagues (2022), who showed that having access to reading materials at home can positively affect reading levels. Further, MGD FFE programs that included components where children are encouraged to read for fun outside of school were positively associated with higher decoding skills and oral language skills. Reading to children at home was positively associated with decoding in Cote d'Ivoire and Mali and did not correlate with oral language skills. Finally, seeing someone reading at home was also an important correlate of both decoding and oral language skills. These findings are corroborated in the existing literature, which shows that factors in the home learning environment such as family learning background, reading activities and spending time on reading, and home resources affect literacy and learning (Friedlander, 2020; Geske & Ozola, 2008; Kumar & Behera, 2022).

Exhibit 11. Association Between Home Literacy Environment and Decoding/Reading Comprehension Skills

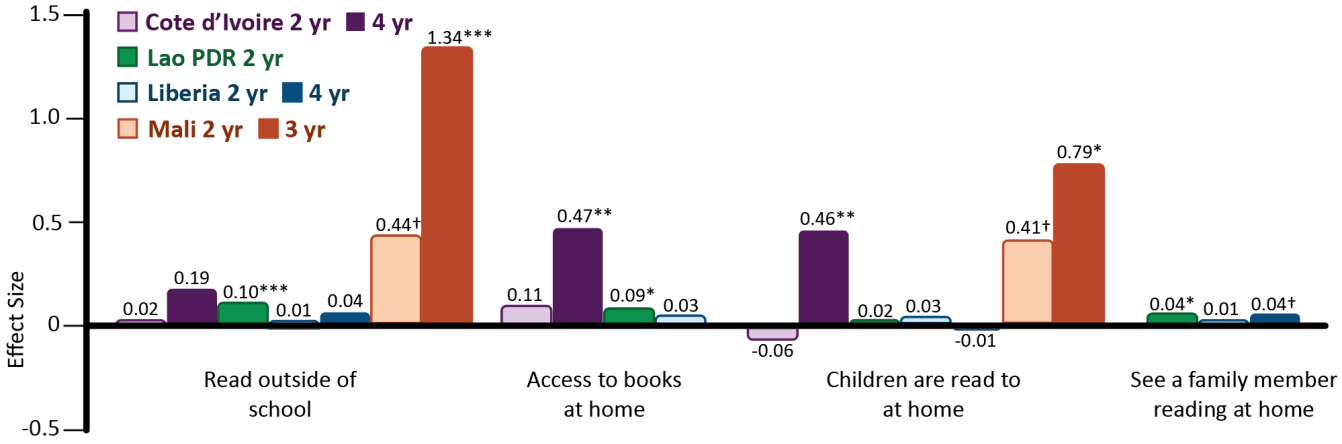


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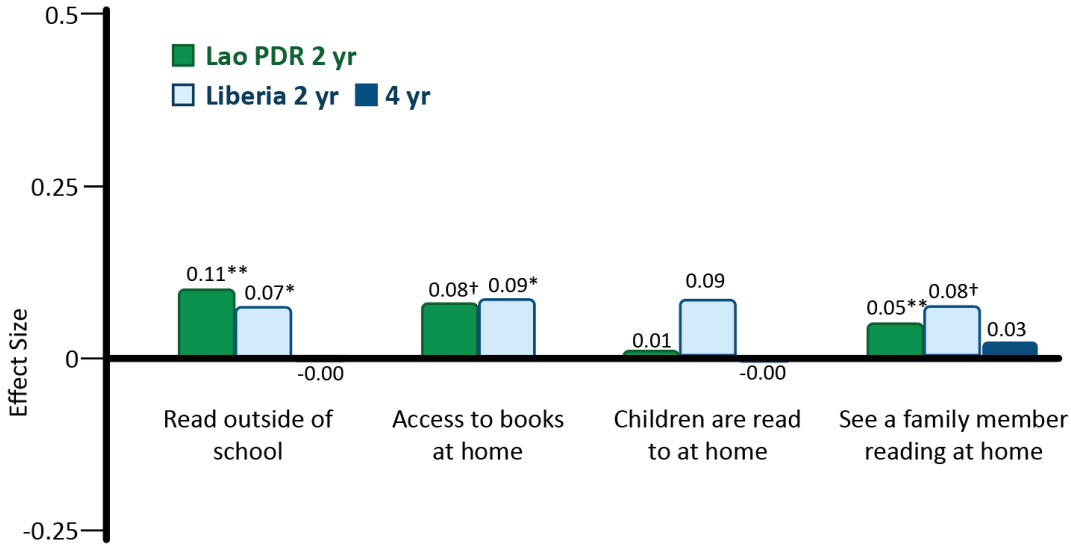
Exhibit 12. Association Between Home Literacy Environment and Oral Language Skills



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Implications

Even though most children in LMICs are enrolled in school, many are not acquiring fundamental skills (Azevedo et al., 2021; World Bank, 2019). To close the learning-poverty gap, various school-based programs are being implemented across the globe that include a variety of activities, from the provision of instructional materials and teacher professional development to classroom supervision. Some programs also incorporate community elements to encourage literacy activities at home and in communities. Multifaceted programs such as the MGD FFE projects examined in this study, which combine school feeding activities and literacy interventions, are promising because of their ability to simultaneously improve health and nutrition outcomes, enrollment, and attendance, and learning among school-age children.

This brief has several practical implications. First, program developers who provide children's textbooks and supplementary reading materials at schools in multilingual environments need to carefully consider the languages spoken by target children and parents (e.g., distributing books written in a language that few potential users speak can limit success). For children to be able to effectively use the books and textbooks, ideally, they need to be written in languages that most children use and understand—which, in turn, relies on evidence-based language of instruction policies. Program developers who plan on writing or reviewing curriculum materials for children need to ensure that the content is based on a scientifically grounded conceptualization of the sequence and trajectory of subskills in not only one, but multiple languages. This would entail understanding issues of transfer of skills across languages and the role that orthographic differences play in quality teaching and learning materials. In addition, teaching and learning materials should embed formative assessments and the

structured pedagogy linked to those formative assessments to enhance the quality, accessibility, and likely effectiveness of textbooks and teaching and learning materials. This approach would also allow for flexibility in using the teaching and learning materials differently with children who have various abilities. Furthermore, program developers should also consider the language and literacy skills of parents so that parents can meaningfully engage with the curriculum materials and support their children in learning.

Second, providing manipulatives and supplementary materials such as cards, letters, and objects to touch and handle as well as posters and illustrated reading boards is positively correlated with higher oral language skills and decoding skills; but these materials also need to be culturally and linguistically appropriate to the student populations who will use them. There is mixed evidence on the use of manipulatives in supporting learning outcomes (McNeil & Jarvin, 2007); however, it is clear that materials that adhere to quality standards by reflecting the cognitive foundations of reading acquisition (Hoover & Tunmer, 2020) and those that are used at the right time and in the right sequence in the learning process (as opposed to being distractors to other deep learning opportunities (McNeil & Jarvin, 2007) are more likely to be effective. In other words, they work best when they are "supplementary" to other explicit teaching methods.

Third, teacher training programs and coaching sessions should stimulate and support teachers in effectively engaging in active two-way student–teacher interactions. Traditional lecture-centered teaching models and classroom teaching practices where students passively listen to stories or lessons should give way to instructional methods that promote student participation, reflection, and collaboration. Although many educational programs focus on evidence-based professional development for teachers, the emphasis needs to be on effective teacher trainings that equip teachers with strategies that work with their student populations.

Fourth, program developers should include reading activities outside of school and should intentionally integrate parents and caregivers in the student learning process. Literacy interventions should incorporate activities with parents even if they are nonliterate, as they are crucial in the development of oral language skills. Nonliterate parents and caregivers can support critical foundational literacy and language skills in *any* language through sound (phonological) games (e.g., saying words backwards, rhyming words and songs, word-building games etc.); "rich talk," including storytelling; asking a multitude of questions; sharing in traditions that involve dialoguing about them (e.g., how the food is cooked, how to measure ingredients, how to sew new clothes, how the farm animals are responding to the weather, etc.); and allowing students to "teach" the parents what they learned in school. These practices not only develop oral language skills in one language, but critically, they support the development of transferrable skills that can help children learn to read in any language that they acquire later.

This brief is one of the first multicountry studies contributing to the broader evidence on effective literacy interventions included in McGovern Dole FFE programming. We examined existing data from

four distinct large-scale programs in Lao PDR, Liberia, Cote d'Ivoire, and Mali, which have been successful in producing significant positive effects on early grade literacy outcomes for students. Analyzing programs from different contexts is important for establishing the external validity of these findings and enables future research to replicate the methods in other contexts. This research has several limitations. First, findings from this study are only applicable to other MGD FFE programming that includes school feeding and literacy interventions, and not necessarily to all types of education programs or stand-alone literacy interventions. Second, rather than having an exhaustive list of components from the literacy interventions, we relied on constructs that we could define using existing survey tools. Third, we are only able to report on correlations in this study because the existing evaluations do not allow for experimental or quasi-experimental frameworks to examine the separate impacts of each component of each literacy intervention. Fourth, none of the included studies measured implementation fidelity rigorously, and thus we are unable to ascertain to what extent the constructs captured the full implementation of the literacy activities in the four countries we examined.

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Appendix

Literacy Factor Definitions
School literacy activities

- **Borrow books from school.** Students reported that school had books other than textbooks to borrow (Liberia); student reported school had storybooks other than textbooks to borrow (Lao PDR); students reported having school textbooks for French or reading-writing last year or access to mobile library or junior dictionaries (Cote d'Ivoire).
- **Access to textbooks in the classroom.** Teachers reported that textbooks were available in the classroom (Liberia); classroom observation showed presence of textbooks or exercise books (Lao PDR); classroom observation showed presence of textbooks (Mali); and teacher reported at least "a few" students had textbooks in their class (Cote d'Ivoire).
- **Access to cards/letters/objects to touch or handle.** Classroom observation showed presence of little objects that students could touch and handle (Lao PDR); classroom observation showed presence of alphabet cards or flashcards (Mali); and teachers reported using sculpted plastic letters to teach reading and writing (Cote d'Ivoire).
- **Access to posters/illustrated reading boards.** Classroom observation showed presence of maps or a globe (Lao PDR); classroom observation showed presence of alphabet posters or text posters (Mali); and teachers reported using illustrated boards to teach reading and writing (Cote d'Ivoire).
- **Hear/read stories at school.** Students reported that the teacher read to them at least "a little" (Lao PDR); students reported that the teacher allowed them to read a text of their choice (Mali).
- **Play educational games at school.** Students reported playing classroom games at least "rarely" in Mali and at least "once during the week" in Lao PDR; and students reported that they participated in reading activities organized by the school in Cote d'Ivoire.
- **Ask questions about stories or lessons.** Students reported that the teacher asks them questions at least "rarely" in Lao PDR; students reported that they asked or answered questions or reported out a summary of previously classes at least "rarely" in Mali.

Home literacy environment

- **Read outside of school.** Students reported that they read books other than schoolbooks at home in the last week (Liberia); students reported that they read outside of school in the last week (Lao PDR); students reported that they read books for fun (Mali); students reported that they read at home alone (Cote d'Ivoire).
- **Access to books at home.** Students reported having textbooks, newspapers, or storybooks at home (Liberia, Lao PDR); students reported that their family has books at home or that there are books for kids at home other than schoolbooks (Cote d'Ivoire).
- **Read to child.** Students reported that someone in the household read to them or told them a story (Liberia and Lao PDR); students reported someone reads to them at least "rarely" (Mali); students reported someone in the household reads to them (Cote d'Ivoire).
- **See a family member reading at home.** Students reported seeing anyone in their home reading (Liberia and Lao PDR).

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