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EGRA Plus: Liberia

Understanding the Causal Mechanisms: EGRA Plus's Effectiveness

Early Grade Reading Assessment (EGRA) Plus: Liberia
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Prepared for
USAID/Liberia

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Introduction

The EGRA Plus: Liberia program was a pilot intervention funded by the U.S. Agency for International Development (USAID)/Liberia and implemented from 2008 to early 2011 by RTI International. . The program had a heavy emphasis on applied research and focused on improvements in the quality of reading instruction and student outcomes as measured by the Early Grade Reading Assessment. The EGRA Plus program measured the impact of two different program designs using a randomized control trial, with three rounds of data collection. The full treatment intervention, implemented in 60 schools in 15 districts and 7 counties, was an integrated reading package. Full intervention included

- the provision of reading materials,
- focused lesson plans covering instruction on the core components of early reading acquisition,
- intensive training of Grade 2 and 3 teachers on appropriate delivery of the lesson plans,
- support from a trained and dedicated instructional coach,
- reading competitions at the district level,
- radio shows, and
- student and school report cards designed to encourage the use of educational data to monitor and improve educational delivery.¹

The second intervention, also implemented in 60 schools, clustered in the same districts and counties as the full treatment, was similar in using assessment and school and student reports cards as levers to improve the quality of education. However, this intervention, called light treatment, differed from the full treatment program in that it did not include the pedagogical materials or training on reading instruction improvement. Its theory of change rested on the ability of *accountability* to encourage pedagogical improvements that would result in improved student learning outcomes.

Both full treatment and light treatment effects were measured against reading outcomes in control schools, which received neither the full nor light interventions, but were assessed three times, similar to the other groups.

The quantitative analysis presented in Piper & Korda (2011)² shows that the EGRA Plus program had a large impact in full treatment schools and a small or negligible impact in light treatment schools. The weakness of this quantitative analysis, like all others of its type, is that while it can argue convincingly for whether or not the program worked, it leaves the key questions of how and why the program was

¹ Districts were selected randomly, proportional to population, so as to be representative of all of Liberia—they happen to have fallen into seven counties. Schools serving as nuclei of clusters were chosen randomly within districts.

² This qualitative report should be read in conjunction with Piper, B., & Korda, M. (2011, January). *EGRA Plus: Liberia—Program evaluation report*. Report prepared under the USAID EdData II project, Task 6, Contract No. EHC-E-06-04-00004-00. Research Triangle Park, NC: RTI International.

effective unanswered (unless there is a single factor in the intervention, in which case proof of impact and analysis of specific cause are one and the same). In other words, while it is important to know whether the program worked, it might be even more important to understand which portions of the program design were responsible for the impacts identified. This report, using additional qualitative data, is designed to answer the *why* question, with a particular eye toward producing recommendations for other projects focused on quickly improving the quality of reading instruction (and instruction in general), and with it, student outcomes in reading. The overarching research questions that drove the follow-up qualitative research were:

- Why was the full treatment program effective?
- What characteristics of the EGRA Plus program were most responsible for the increases identified?
- Why did light treatment increase reading outcomes slightly?
- Why did control school reading outcomes also increase?
- Why was the program effect differentiated by student gender and grade?
- Did the program increase enrollment as well as improve student outcomes?

Research Design

In order to collect data useful for understanding the key elements at work in the EGRA Plus program and to answer the questions above, we took care to consider the causal mechanisms at work in the program. Based on work in the field of theory-based evaluation, the research design for this report looked at the theories of change from the pedagogical portion of the project. The research design matched program characteristics with teacher thinking, teacher thinking with teacher behavior and pedagogy, and pedagogy with improved student achievement. For the accountability portion of the project, the research design matched the accountability measures to accountability at the school level among teachers, the community, and schools; accountability to teacher behavior; and teacher behavior to student reading outcomes. The research design, then, attempted to measure whether there was evidence that the assumed causal mechanisms were employed.

During the follow-up qualitative research, several research protocols were developed. Interview protocols for teachers, principals, instructional coaches, District Education Officers (DEOs), parent teacher associations (PTAs), and community members were prepared and followed (see *Appendix 1*). These protocols included a set of interview questions and then a ranking exercise, where participants were asked to rank several characteristics of EGRA Plus on their importance to improving education quality. In addition, oral reading fluency and reading comprehension were reassessed in a randomly selected group of children at each school using a portion of the EGRA instrument (see *Appendix 2*) to determine whether the effects of EGRA Plus were robust to the passage of several months of time, and also as a sort of reaudit. The oral

reading passages and associated reading comprehension questions were taken from the English version of the Kenya EGRA in 2009 (Piper, 2010).³

These qualitative research protocols were buttressed by a more careful analysis of school- and teacher-level characteristics fit against the quantitative analysis presented in early reports. Specifically, this report presents the results of a school-level (rather than student-level) analysis of school and teacher predictors on school-level EGRA outcomes. Additional data were collected from instructional coaches to determine whether school-level variation mattered, as well as to know whether *individual* coaches had differing levels of impact on student achievement on EGRA measures.

Schools were selected as follows for the qualitative follow-up sample. In order to understand the mechanisms most responsible for the improved student outcomes, we compared several full treatment schools whose outcomes improved in very large amounts with those schools that improved much less. We also chose control and light treatment schools with very large gains on oral reading fluency. We visited six full treatment schools that had large gains, three full treatment schools with small or negligible gains, and two light treatment and two control schools that had large improvements. We were able to cover nine districts and seven counties between November 15 and December 17, 2010.

Why Was EGRA Plus Effective?

In this section of the report we present some of the consolidated findings that illustrate the means by which the EGRA Plus program was effective. As explained above, this report focuses on *why* rather than *whether* the project was successful, and for the most part it uses data collected from the EGRA Plus full treatment schools to investigate the causal questions.

We asked teachers, principals, and instructional coaches in the effective schools to rank several characteristics of the EGRA Plus program according to their importance in sustaining large reading improvements. The findings, culled from 19 teacher interviews, 12 principal interviews, and interviews with all 15 instructional coaches, are summarized in **Table 1** below. The table shows remarkable consistency in participants' views of which portions of the program mattered the most, as can be determined by examining the variance for each variable. The question underlying this analysis was twofold: first, what were the individual characteristics deemed of greatest importance, and second, what was the comparative effectiveness of the program components related to instructional supports and material development against those components related to improving the accountability of the school system to the community and to parents. Critically, the top four elements of the program (teacher training, lesson plans, coach support, and book materials) were all pedagogical and material inputs. On the other hand, the four elements least critical to

³ Piper, B. (2010). *Kenya Early Grade Reading Assessment findings report*. Report prepared for the William and Flora Hewlett Foundation under Grant No. 2008-3367. Research Triangle Park, NC: RTI International. <https://www.eddataglobal.org/documents/index.cfm?fuseaction=pubDetail&ID=275>

program success (reading competitions, student report cards, radio shows, and school report cards) were all the accountability inputs.

Table 1. Participant rankings of EGRA Plus program components

Participant group	Pedagogical and material inputs				Accountability inputs			
	Teacher training	Lesson plans	Coach support	Materials (books)	Reading competitions	Student report cards	Radio shows	School report cards
Teachers	2.9	2.1	3.6	5.1	3.4	5.1	6.6	6.4
Principals	2.3	2.6	4.4	4.3	3.4	5.7	5.9	7.2
Coaches	1.8	3.3	2.4	3.4	5.1	6.3	6	7.5
Overall	2.3	2.6	3.5	4.3	4.0	5.7	6.2	7.0
(Rank)	1	2	3	4	5	6	7	8
(Variance)	2.8	2.0	3.0	3.7	3.3	2.7	2.2	1.7

The five-day professional development courses led each semester by the EGRA Plus team were cited as the most critical area for program success, according to our participants. When asked why the professional development was critical, several terms were repeated by participants, such as “beginning,” “fundamental,” and “essential.” Seen as particularly helpful were the parts of the sessions that focused on demonstration and practice with new lesson plan delivery methods, rather than, as these types of sessions often do, simply providing teachers with five days of lecture.

Asking teachers to demonstrate the new methods ensured that the training did not “lose them,” as EGRA Plus reading expert Dr. Marcia Davidson noted; and it also resulted in higher levels of engagement by the teachers. That is to say, given that teachers were aware that they would have to deliver a new method for the group the next day, teachers spent significant amounts of time preparing their material. It is logical that this type of activity is much more effective at ensuring the take-up of new knowledge, and more importantly, resulting in behavior change reflected in changed pedagogical methods. In short, as one coach put it, the professional development sessions were the essential strategy for “developing human resources.”⁴

The lesson plans were ranked second overall and were cited as “essential” to the program. Repeated several times was the important role that they played in allowing the teachers to have an easier time of focusing on instruction rather than on planning. One teacher, when asked why lesson plans mattered so much, looked slightly amused as he noted that you “have to do lesson plans.” His point was that in order to have such a dramatic change to the instructional paradigm in reading, the EGRA Plus program’s decision to specify lesson activities was critical: Teachers were able to

⁴ While technology applications were not a part of this particular project, thought must be given to using video as a means of reducing the cost associated with the implementation of these intensive professional development programs. That is particularly the case if it turns out that it is the quality of the instruction given that matters, more than the depth of the interaction.

focus on the quality of pedagogical delivery rather than on what pedagogical strategy to use.

Coach support was identified as the third most important component of the educational package in the program. One participant noted that the coach was the “current for the electrical wire.” He went on to expound that the program had put many key elements in place, such as materials and training (the wire), but without the practical, day-to-day support of the coaches (the current), teachers would have found it much more difficult to actualize the ideas of the program. Indeed, the expansive (but often ignored) literature on in-service teacher professional development shows that teachers, as adults, learn somewhat differently from children. Successful professional development programs provide teachers new information, of course, but also opportunities for practice, reflection, and adjustment with other educators engaged in similar activities. EGRA Plus’s design allowed opportunities for teachers to do this, quite frequently. Another teacher noted that the coach was important because the coach helped to train the teacher, and in her mind, the professional development and ongoing pedagogical supervision and support were integral to program success, at the same time as the coach’s support was integral to the ability of the professional development to change their practice.

Fourth in importance was the provision of books, materials, and other teaching aids. The materials included two sets of decodable books, additional books for school libraries, pocket charts, and letter and word flashcards. Although the materials were not ranked in the top three, participants still deemed them to be an essential element of the program. Two responses help summarize the feeling of the participants about the materials. One coach noted that since Liberian classrooms often suffer from a dearth of government-provided reading materials, and since supplementary materials are difficult to come by, the books were a great help. This was a mixed blessing, as we explain in later sections of the report.⁵ Another coach put it this way: “If you have books, you get results.” Our classroom observations showed that, for the most part, children had the decodable book sets and they were often in use during the reading lessons. Given the scarcity of other materials, it makes sense that these materials would be a welcome addition and an essential element to a highly successful new program.

Somewhat distant in the rankings from the top four components (all related to pedagogical and material inputs) were all four of the accountability measures. The most important of those elements were the district-level reading competitions. Competitions were held once each during both the 2008–09 and 2009–10 academic years. That each group (teachers, principals, and coaches) cited the reading competitions as more critical to the success of the EGRA Plus program than either the school or student report cards was a bit of a surprise to the EGRA Plus staff, particularly because much more time and money was invested on the report card

⁵ In brief: many teachers used the EGRA Plus materials (which also were used within USAID’s Core Education Skills for Liberian Youth [CESLY] program) in sessions where they combined the children from an Accelerated Learning Program (ALP) with children from the “regular” school, since the regular school program had few (or no) materials to use.

system (discussed below). The teachers noted that the reading competitions served as a significant motivator for the students. Coaches and principals argued that the competition was a stimulant for the schools that performed well, and a strong shock for those that did not, allowing them to overcome their “reluctance” to engage in the program. Notably, then, the reading competitions served in the roles designed for the school report cards: a stimulus to action for the poor-performing schools and a motivation for the successful schools.

Student report cards were often cited as taking up a significant portion of the time spent by teachers on EGRA Plus. In many cases, however, this was a complaint from the teachers. These teachers stressed that the amount of time spent assessing children for the report cards was not worth the outcomes. In contrast to typical assessments for “other programs,” which could simply be written up on the board once, the student report cards required that the teacher read with each and every child. The teachers saw the report cards as a burden, in many cases, and a disincentive for “doing” the EGRA Plus program. Participants understood the formative assessment role that the student report cards played in the project, but one noted that the report cards only would tell you if the project was working rather than serving as an integral part of the project itself. It is not clear whether this means that the report cards were unsuccessful, per se, because the standard practice of modest, if any, formative assessment in the schools visited might allow struggling children to be ignored by the teacher. EGRA Plus succeeded for children across the distribution (weak, average and strong readers), suggesting that something within the program, possibly student report cards, encouraged teachers to focus on children heretofore ignored by the system. This possibility must be weighed against the finding that teachers saw the report cards as the major impediment to full uptake of the program: They caused some teachers to put EGRA Plus in a category of “additional work.”

There was less evidence that the radio shows, ranked seventh, were heard by many participants. It appears that they were not very often heard, and when they were, the impact on the program was very limited. The program might be improved by more carefully targeting the times and advertising for the radio shows for consumption by school stakeholders (e.g., by convening a PTA meeting to coincide with the radio shows).

The school report cards were cited by principals and coaches as being the least effective strategy, and by teachers as the second least effective. This is in contrast to light treatment schools, where the report cards seemed to provide an impetus for action in some schools. It appears that the school report cards, as designed, were not very effective for full treatment schools since they were little used, with more than half of the principals interviewed unable to recall the use of school report cards in 2009-10. Where they were utilized, they were seen as redundant with the reading competitions, which seemed to do a far better job of communicating the relative levels of reading skills for individual children as well as schools.

It is worth repeating that the pedagogical and material inputs proved to be much more critical to program success than were the accountability inputs. This is mirrored in the program evaluation (Piper & Korda, 2011), where the research design showed that the

accountability inputs found in the light treatment schools had little or no impact, while the additional inputs in the areas of pedagogical improvement and material supports were hugely successful.

What Characteristics of the EGRA Program Were Most Responsible for the Increases?

One method we used to investigate the mechanisms by which EGRA Plus was effective was to divide the set of 60 full treatment schools into three groups based on the change in oral reading fluency per minute from baseline to final assessment, differentiating among the schools with high gains, those with moderate gains, and those with low gains. The low group averaged a gain of 1.9 words per minute, the moderate group 31.2 words per minute, and the high group, 61.3 words per minute. Many of the analyses presented below use these groupings to investigate whether there are systematic differences in some of the predictive factors related to outcomes. In fact, this section shows that there are quite large differences among the groups (see *Table 2*).

Table 2. Oral reading fluency gains for low-, moderate-, and high-gain schools

Oral reading fluency gain group	Number of schools	Gain in words per minute		
		Minimum	Average	Maximum
Low-gain school	19	-16.7	1.9	16.8
Moderate-gain school	20	18.9	31.2	42.3
High-gain school	21	43.1	61.3	91.8

Figure 1 compares the time that coaches spent traveling to each school.⁶ There were large differences in the travel times for the three groups, with low-gain schools taking nearly twice as long to reach as high-gain schools. This appears to be a school effect rather than a coach effect.⁷ That is, the figure reflects the school's general accessibility (for the school system, not only for the coach).

⁶ Note that an additional variable was fit in the regression model as well: the travel method (walking, motorbike, bicycle, car, or other). It had far less predictive ability since nearly all the schools were accessed by walking or by motorbike. Even when we controlled for travel method, the relationship between oral reading fluency gain and travel time remained the same.

⁷ Because the effect remains when the coach is controlled for in a regression model, it can be argued that this is truly a distance effect, not the effect of the coach him/herself. However, because coach is coterminous with district in the analysis, it is difficult to know whether these findings are truly at the district or coach level, or whether they are proxies for other factors at the school level that are related to being far from the district capital, such as income, human resources (for the teachers), or the like.

Figure 1. Travel time (in minutes) for low-, moderate-, and high-gain schools

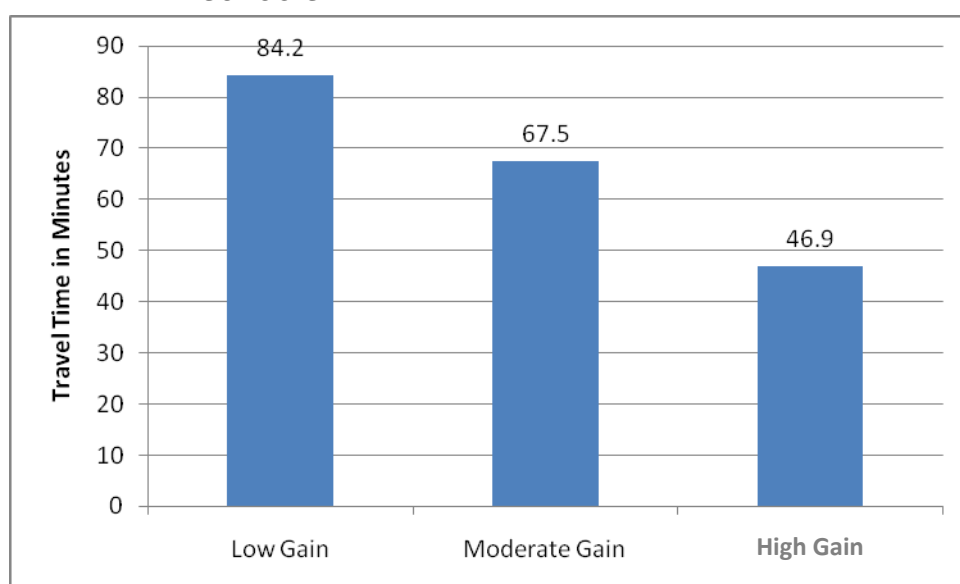
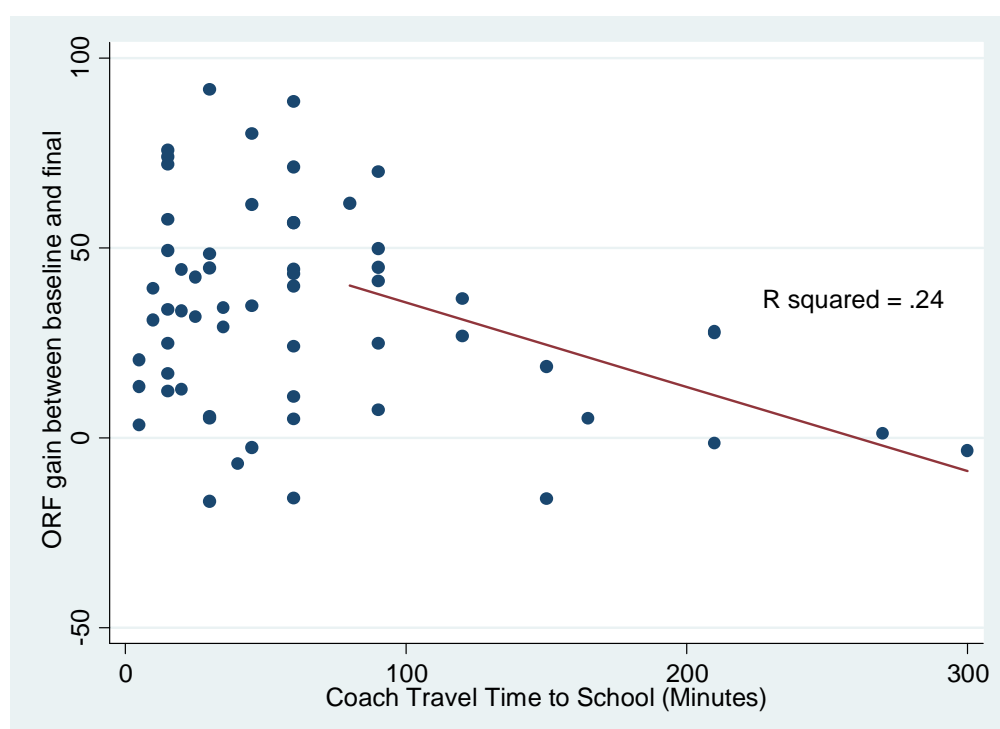


Figure 2 shows that the relationship between travel time to schools and oral reading fluency was quite strong above 60 minutes. Under 60 minutes, travel time was not statistically significantly related to oral reading fluency (p -value .92). On the other hand, travel time was related to oral reading fluency gain at 60 minutes (p -value $<.01$), such that for every 10 minutes more in travel time, the oral reading fluency gain was two words per minute less. This is moderately predictive, with an R squared of 0.24.

Figure 2. Scatterplot between oral reading fluency gain and coach travel time (minutes)



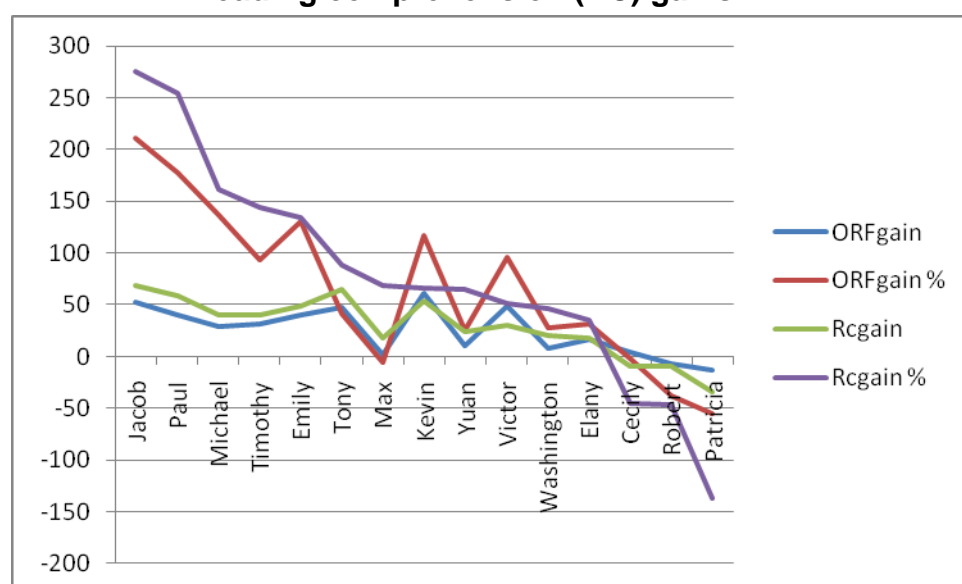
It appears, then, that when travel time is more than an hour, factors at the school level are related to the school's ability to be successful with the EGRA Plus program. The reason for this negative relationship at one side of the distribution remains unclear. The simplest interpretation is that when coaches live far away from a school, the distance limits the quality of their interaction with the teachers at the school, and the program is not taken up as well as with closer schools. This makes sense, given that coaches were not given bonuses in travel allowances for the frequency of their interactions beyond the one visit per month per school that each coach was quite capable of doing very easily. Therefore, there was a relatively strong disincentive for the coach to visit the schools that were farther away more often.

This speculation presupposes, however, that the coach effect on student outcomes in this project was extremely large, and that a manipulation of plus or minus one coach visit would have huge impacts on student outcomes. A slightly more plausible argument (if one has to choose) is that the coach's travel distance was not the predictive variable at all. Rather, the characteristics of schools that were located farther from a town (where the coaches lived) made them less likely to enjoy large gains from the program. Careful thought must be given here, however, since it is not just saying that it is the characteristics of these remote schools that make them unsuccessful at teaching reading, but also that it is those characteristics of the school that make them less likely to enjoy large *gains* from the EGRA Plus program. To make this a plausible causal connection, then, one would have to argue that these remote schools had characteristics that made them more resistant to change or less open to new innovations. This is possible, of course.

In short, some combination of the coach effect and the proxy for distance that this coach effect takes up was responsible for the limited take-up of the schools located far from the coach's residence.

One of the questions that drove this analysis was whether the *individual* coaches themselves mattered (that is, whether there was an individual coach effect). If so, the implication is that coach training and support is critical, and significant investments should be made to ensure that high-quality coaches are hired and retained. **Figure 3** shows the average oral reading fluency and reading comprehension gains associated with each coach. (The coach names are pseudonyms.) Each line indicates the difference between the gains in full treatment and those in control schools. The smoother blue and green lines indicate the absolute gains for the oral reading fluency and reading comprehension subtasks, while the spikier purple and red lines represent the gains for the two tasks in percentages from the baseline levels. The figures indicate that the coaches do matter, and quite a bit. In regression models with coach dummy variables (not shown), coach effects explain a lot of the variation in oral reading fluency gains ($R^2 = 0.88$). In short, coaches in EGRA Plus did matter, and the program was successful largely because the coaches were successful. Put another way, the program was successful *where* the coaches were successful.

Figure 3. Fixed effects of coaches on oral reading fluency (ORF) and reading comprehension (RC) gains



From the coach interviews, several characteristics of the coaches emerged as critical factors in the success of the program in individual schools. Initially, we investigated whether the frequency of visits to the schools mattered. It turns out, however, that there was not a tremendous amount of variation in the frequency of school visits (although one coach did admit that she visited the nearby school—within walking distance—more than the other schools). All coaches, when asked about the frequency of their visits, indicated that they visited each of the four schools in their cluster between two and four times per month, with some variation by coach, and most coaches made three or fewer visits.⁸ This seems to show that the coaches mattered quite a lot, but this finding might be accentuated in the EGRA Plus program given the low number of schools for which each coach was responsible. It is plausible that even if there were no differences in the frequency of visits for schools with different levels of gain, the distances to school and the short duration of class time in most observed schools in Liberia (most end by noon) means that if the travel time was long, then much of the potential time to observe and coach would have been lost by the time the coach arrived.

A key characteristic of the coaches that seemed to make a big difference in reading outcomes was the coaches' "persuasive" ability. As one coach put it, a large part of their job involved encouraging, cajoling, and supporting teachers to make relatively major changes in their pedagogy. Although other parallel programs (namely the CESLY project and the ALP Plus project that preceded it) were paying teachers for additional work,⁹ the EGRA Plus program's design could not allow for such

⁸ This is notably more than the program expected, interestingly.

⁹ The payments were relatively substantial. In the 2008 to 2010 academic years—corresponding to the duration of the EGRA Plus program—ALP and CESLY teachers were provided a stipend of 50% of monthly salary to work in Alternative Learning Programs. This figure initially amounted to \$15 per month when teachers were being paid \$30 in salary, and then ballooned to \$50 a month in 2010–11, when teachers were paid at \$100 per month. The stipend covered additional work after hours, because these teachers were to provide afternoon or

payments. As a result, many participants noted that teachers needed some “encouragement,” “incentive,” or other type of inducement to do the extra work.

When given this information, the EGRA Plus staff, and particularly the Liberian project manager, Ollie Collins, told the coaches to “make it work.” She asked the coaches to ensure that the teachers understood that this program was designed to ease their workload rather than increase it, by providing materials and lesson plans. If teachers were not swayed by that argument, she required the coaches to make sure that the program was successful by virtue of their “powers of persuasion.” This skill in coaches is likely to continue to be a characteristic that is predictive of the success of the program if the distortions in the teacher incentive structure persist, as well as a lesson learned for other similar programs in other countries.

Another characteristic that seemed to matter was the coaches’ knowledge of the basics of early reading. Some of the more skilled and knowledgeable coaches were asked to train the trainers for the CESLY program and thereby increased their confidence in their technical craft. This, combined with the time commitment that some of the coaches were willing to provide, as a “sacrifice” to ensure the success of the program, were the essential coach factors that contributed to program success.

EGRA Plus and Teachers

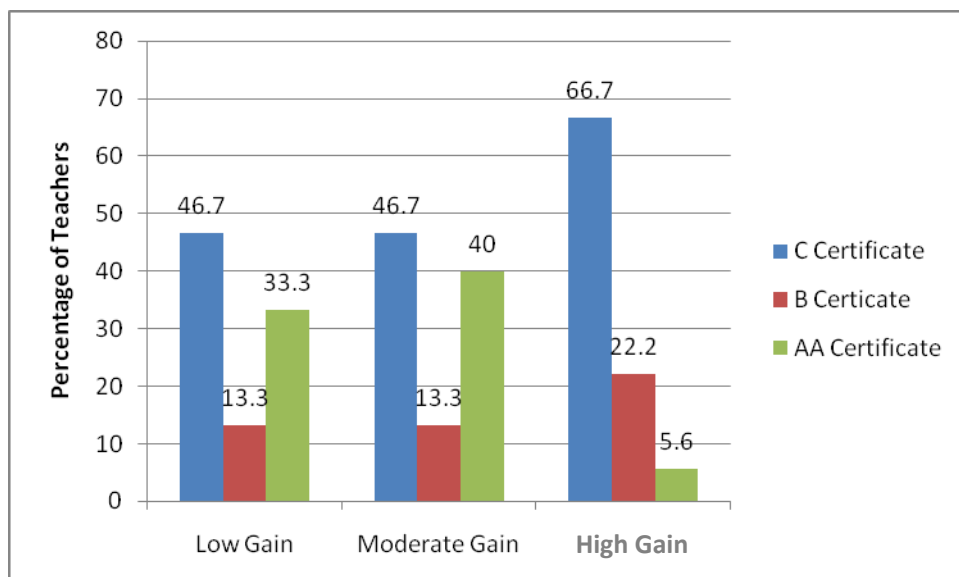
It might have been that the schools with large gains were successful because of the stock of teachers that already existed in their schools. To test this, we compared the qualification levels of teachers in low-, moderate-, and high-gain schools, as presented in *Figure 4*. If the program was simply tapping into an already better-educated and higher-skilled teacher workforce, then we would expect that the levels of qualifications would be significantly higher in high-gain schools than in low-gain schools.

In fact, the opposite was true. A higher percentage of teachers with C certificates were in high-gain schools, and a much lower percentage of AA certificates. It might be, then, that teachers with lower qualifications were more likely to see EGRA Plus training as a means to improve their skills and increase their qualifications, and they were more receptive to change; or it might be that teachers with fewer paper qualifications were less reliant on *any* existing method that was set in their minds, and thus the provision of any method made a big difference. The question cannot be resolved in this analysis.

evening sessions for the ALP children. However, given that the typical Liberian system lacked the types of materials that had been provided for ALP, many teachers and schools combined their regular classrooms with ALP classrooms and taught both groups in the morning session. As a result, these teachers did not teach any more hours, but got a 50% stipend for being in another program. EGRA Plus was seen as a program similar to ALP and CESLY, and teachers continually asked for—and in some cases, demanded—a similar stipend for the work, which EGRA Plus would not provide.

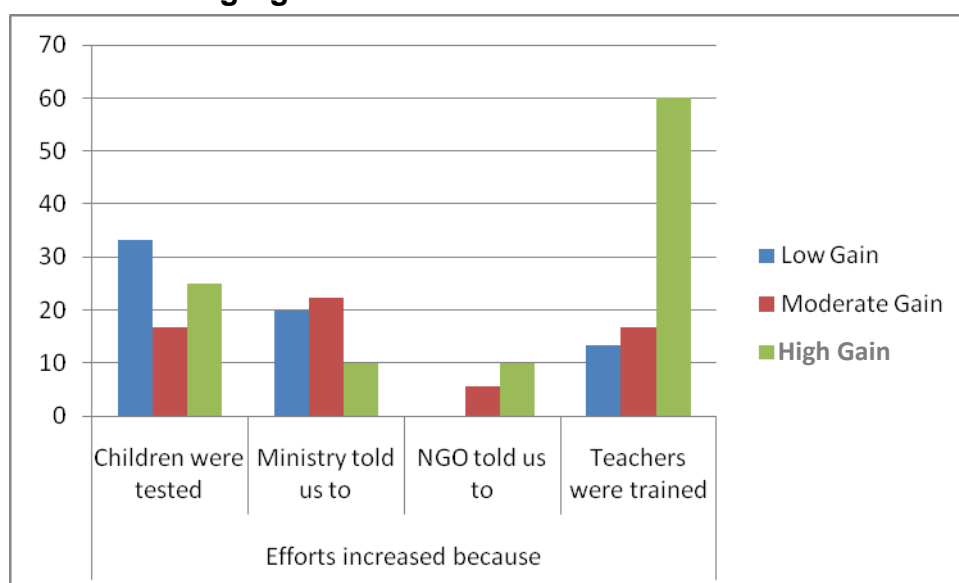
In any case, EGRA Plus was able to take less qualified teachers and make them much better teachers of reading than they were. This is a testament to the decision-making on the part of the EGRA Plus program, particularly with respect to the decision to simplify the teacher lesson planning process by creating structured lesson plans for these relatively undertrained teachers.

Figure 4. Teacher qualification levels in low-, moderate-, and high-gain schools



In searching for the causes of EGRA Plus's impact on student achievement, we investigated several other variables in the quantitative school-level data set from the teachers, and related that to student outcomes. **Figure 5** shows teachers' responses when asked why reading efforts had increased since the beginning of the program.

Figure 5. Reasons for increased efforts in reading in low-, moderate-, and high-gain schools



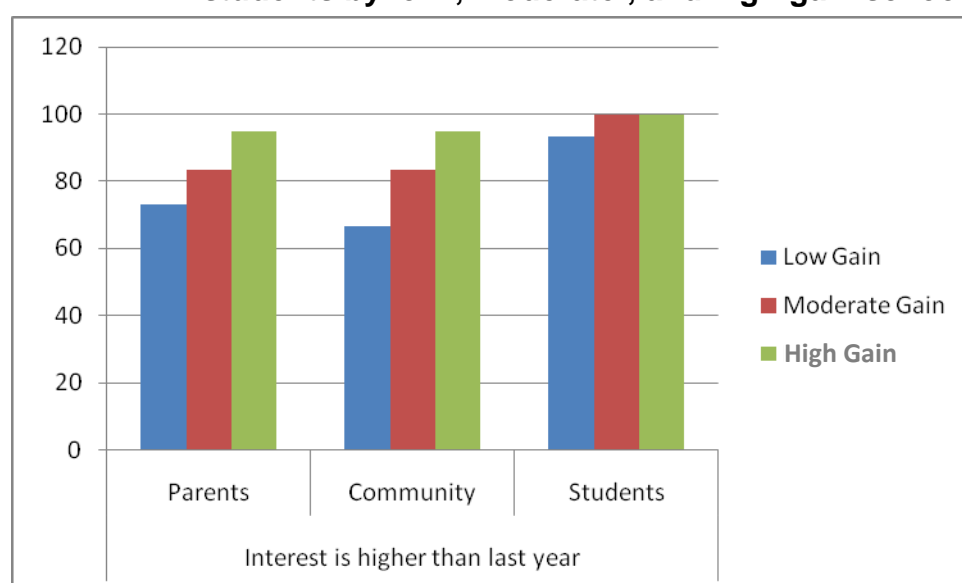
Note that there is no obvious pattern for the response “Children were tested,” which means that at least among full treatment schools, the assessment itself did not drive the gains. There is similarly no obvious pattern for either the “Ministry told us to” or an “NGO [nongovernmental organization] told us to.” The main difference is for the response “Teachers were trained,” whereby 60% of teachers in high-gain schools noted that the training was the reason for the increases. On the other hand, less than 20% of moderate-gain and low-gain teachers made the same claim.

Could it be that the training itself, an increase in professional knowledge for teachers provided with little to no in-service teacher professional development in the area of reading, was the spur that encouraged change in schools and classrooms? The evidence presented below backs up this claim. If this is true, the EGRA Plus program’s success with reading outcomes stems from the increased reading outcomes emanating from improved teacher pedagogy in reading.

To investigate differences between low or moderate gain schools and high-gain schools, we examined the teacher questionnaire items that focused on changes in parental, community, and student interest in reading. **Figure 6** shows the percentage of teachers who felt that interest in reading was higher this year (2009–10) than in the previous year (2008–09). All three groups of schools (low-, moderate-, and high-gain) enjoyed increased interest in reading among parents, the community, and students. High-gain schools saw a greater jump in interest than did moderate-gain schools, and moderate-gain schools a greater increase in interest than low-gain schools.

The causal relationship here is not obvious, but it might be that high-gain schools had learning gains that were obvious to the parents and the community, which increased interest. At any rate, it appears that at least some small percentage of the gains in EGRA Plus were due to an increased interest and focus by the community, parents, and students.

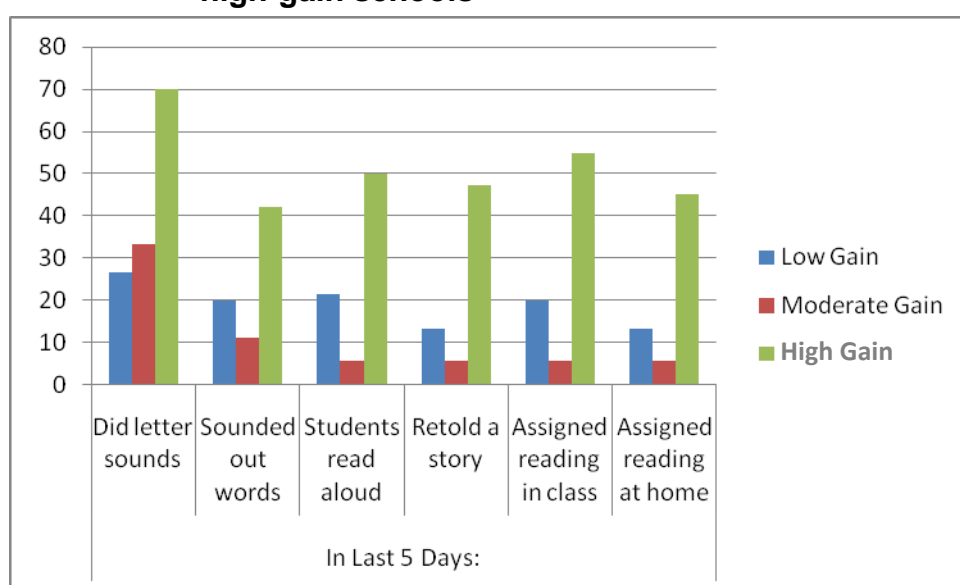
Figure 6. Increased interest in reading for parents, community, and students by low-, moderate-, and high-gain schools



Given the finding above, we are left to continue examining potential mechanisms for the increases in student achievement felt in EGRA Plus schools, since increased interest and focus do not explain the increases fully. If the teacher training itself spurred the school to action, we would expect that the training would be evident in classroom behavior.

In **Figure 7**, the responses to a set of items on the teacher questionnaire have been matched with student outcomes. In these items, teachers were asked whether they seldom, sometimes, or frequently engaged in particular pedagogical practices over the past five days. Figure 7 presents the percentage of teachers who said that they had frequently engaged in the given pedagogical strategy.

Figure 7. Frequency of pedagogical strategies used in low-, moderate-, and high-gain schools



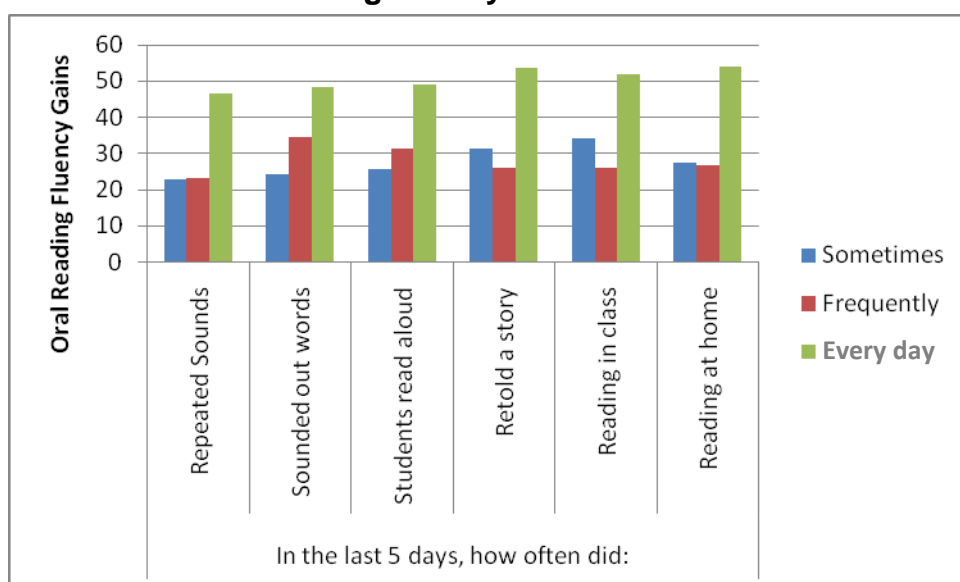
The pattern is striking. While 30% or fewer of moderate- and low-gain teachers cited that they used these strategies frequently, between 40% and 70% of high-gain teachers said that they did. The gap in strategy frequency between low/moderate schools and high-gain schools ranged from 30% to 50%. Figure 7 makes the case that much of the difference in outcomes between high- and moderate/low-gain schools stemmed from pedagogical strategies used. That is, high-gain schools more frequently used the types of strategies that EGRA Plus argued would increase the quality of reading outcomes. Children, then, learned to read by being taught how to read consistently, using the variety of methods indicated in the figure.

This point, while maybe an obvious one, is also a critical one. The evidence suggests that the program was successful because it encouraged teachers to change their pedagogy in ways that was related to improved student outcomes. It also calls into question how moderate-gain schools increased their oral reading fluency (by 30 words per minute, on average) if these methods were less frequently used. It appears that even modest increases in proven pedagogical strategies used can have a large effect,

particularly when combined with an intense “focus” on reading and the importance of it for future success.

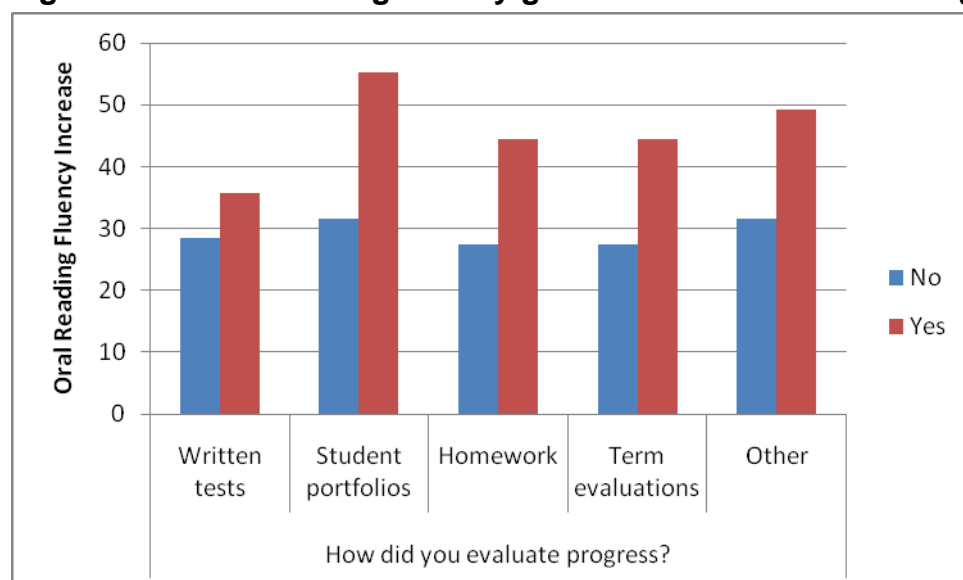
Figure 8 makes the point another way. Instead of comparing low-, moderate-, and high-gain schools to each other, this time the y-axis is oral reading fluency gains at the school level compared to schools where the various pedagogical strategies were employed sometimes (blue bars), frequently (red bars), or every day (green bars). It shows increases nearly 30 words per minute higher for schools where these strategies were used every day. When EGRA Plus take-up was good (vis-à-vis lesson plan usage), then student outcomes were higher than where the take-up was modest or intermittent. At risk of stating the obvious, teaching children how to read results in larger reading increases.

Figure 8. Frequency of reading pedagogical strategy compared to gains in oral reading fluency



The differences were found not only in pedagogical strategies, but also in classroom assessment strategies. **Figure 9** presents the findings from an item on the teacher questionnaire that asked whether teachers evaluated progress using written tests, portfolios, homework, term evaluations, or other methods. For every item, if the teachers said yes, they did use that assessment method, the school oral reading fluency increases were higher. Note that these types of progress evaluations were more traditional than were the student report card methods discussed above. For these traditional methods, if they were used in the reading classroom, oral reading fluency gains were higher than if they were not used. Therefore, while teachers might have complained about the additional time spent preparing student report cards, other forms of progress monitoring were related to gains in the EGRA measures. The theme remains strong too: If teachers taught more reading, and assessed the quality of students’ learning in reading more frequently, using a variety of evaluation methods, the program increased student achievement significantly.

Figure 9. Oral reading fluency gains and assessment strategies



Key Components of the EGRA Plus Strategy

Above, we presented some of the factors associated with increased oral reading fluency and reading comprehension gains in many of the EGRA Plus schools. In this section we provide more context at the classroom and school level as to what we saw associated with high levels of school outcomes. Recall that the research design of the qualitative follow-up study meant that we observed several schools that had large increases in student outcomes from the baseline to final assessment. The themes that this section highlights are

- new pedagogical strategies,
- successful uptake of training,
- quality of teaching,
- coach characteristics,
- program management, and
- decoding improvements.

New pedagogical strategies overcame traditional strategies. One theme that was consistent throughout the interviews and evident in the classroom observations was the pedagogical strategies used and the dichotomy between the old, regular or traditional method of teaching reading and the new or EGRA way. One coach defined the “regular” method as “teacher has the book in hand, just reads, and asks children questions. Children don’t have books, and didn’t teach reading five times per week.” Another coach defined the “traditional” method as “teachers read, then students read after. There was no real method of teaching [reading].”

These traditional methods were evident in one control school, where the students repeated words after the teacher, although the only book was in the teacher's hand. When that teacher was asked during the interview how she taught letter sounds, she said that she wrote the letters on the board. When asked how she taught children to decode or sound out new words, she replied that she called on the children one by one to say the words aloud after her.

In stark contrast, rich and varied instruction was evident in some full treatment schools (not all, however), where during the observation, children were practicing the relationships between letters and sounds orally, teachers were using pocket charts to engage children in creating new words based on the sounds of the words, and teachers even had children figure out what would happen if the vowel in a three letter word (consonant-vowel-consonant pattern) was removed and another vowel was inserted. When asked how they would teach letter sounds, full treatment teachers answered, "Say the sound with an example so they don't forget," or "Say letter sound for them, [and] have them say it after. Have them repeat over and over." Another teacher argued that the best way to practice letter sounds was to use flashcards and pocket charts. These teachers were much more able to justify the reasons for their choices of methods. When asked about how to teach children decoding, the full treatment teachers cited strategies such as "show children the sounds, connect the letter names, words, and sounds." Another teacher differentiated between reading sight words, which the children would have to memorize, with decodable words, which should be "pronounced by the teacher first, and then give the children the meaning, after which, they should decode the word." Similarly divergent answers were given when full treatment teachers were asked for their strategies for ensuring children's comprehension.

EGRA Plus professional development changed teacher behavior. It appears that EGRA Plus was successful largely because teachers had a much wider range of pedagogical strategies with which to implement the curriculum, more materials to use, reading materials to refer to, and additional teaching aids to supplement the teaching. More than just the knowledge, though, the evidence shows that in the high-gain full treatment schools, there was a higher incidence of these methods used in the classrooms. This shows that, for most of the schools visited and teachers interviewed, EGRA Plus had accomplished the first task of giving teachers new information about how to improve their teaching, but more importantly, helped the teachers to actually adopt the methods in their classrooms, and for many teachers, fundamentally changed the way they thought about how children should learn to read.

This had impacts on the students' ability to read, as evident in the quantitative study, but also in the small sample of children who were assessed in this study, where children in full treatment schools read three times as fluently as those in control schools (52.7 wpm versus 14.5 wpm). The gains identified in June 2010 persisted through the end of 2010, which is strong evidence that EGRA Plus went beyond the initial obstacle of many teacher professional development programs (which are overwhelmed by the difficulty in encouraging pedagogical changes, and have to be satisfied with simply teaching teachers new material that they eventually choose not

to implement). EGRA Plus worked because teachers learned new information and implemented it, and as a result, children were learning better.

Increased quality of teaching and unexpected results. It appears that in some successful schools, EGRA Plus resulted in a sea change in the quality of pedagogical delivery. For example, one school we visited noted that the community's awareness of the improvement of reading outcomes (attributed by the principal to EGRA Plus) was the reason that this school (a private school, unlike most of the other EGRA Plus schools) saw its enrollment increase from nearly 500 in 2008 to around 700 in 2009, and then 890 in 2010, the current school year. Ironically, while this program had proved a boon to the school's enrollment, the program's training also proved a boon to the teachers' employment prospects. The second grade teacher at this school was unavailable due to "administrative" reasons: She had been recruited to another higher-paying private school. The coach noted emphatically that the teacher who left had been the best teacher in all of his schools. While the enrollment increases found in this school were notably large and had differential effects since the school was a private school, many full treatment schools also enjoyed large enrollment increases.

Critical role of coaches and instructional time. It is important to reiterate the importance of the coaches to the outcomes seen in these studies, particularly their persistence and persuasive ability. The qualitative follow-up research revealed that EGRA Plus was operating in a particularly volatile environment with respect to the teacher labor market. Some teachers trained in the first year of the program who had only volunteer teacher status were let go because of a new government policy. Remaining teachers faced very strong disincentives for engaging for free in the "extra" work that EGRA Plus required when other programs were offering significant financial incentives. Combined with the extremely limited amount of class time spent on reading (or in school at all), EGRA Plus might have been most successful simply by increasing the amount of time spent on reading. Officially, most schools were teaching language arts (including reading, literacy, writing, speaking, and listening) three times a week for 45 minutes, but with the wastage of class time evident in light treatment and control schools, actual pedagogy delivered might have been half that.

Post-EGRA Plus, on the other hand, teachers were teaching for 45 minutes five times a week. While even the observations for this follow-up revealed that 45-minute lessons might only take 10 to 15 minutes, in some instances, simply increasing the number of days spent on reading from three to five meant a 67% increase in reading time. Increasing the amount of time within language arts spent on reading also made a difference, as did the examples of schools that spent 45 minutes or more on a single reading lesson.

Moreover, coaches' consistent visits to the small number of schools for which they were responsible increased greatly the amount of outside observation, which likely played a role in ensuring that more time was spent on reading. This is not to ignore the several coaches who noted that some of their teachers would still be on the very next lesson in the lesson plan book at their subsequent visit, two weeks later. Even at the low end, then, EGRA Plus likely increased the amount of time spent on reading by a factor of two. There should be little surprise that reading outcomes also increased.

Dynamic technical program management. The findings also showed that the program management, and particularly the presence of the local project manager, Ms. Collins, was critical to the ability of coaches (and therefore the program) to overcome the challenges faced in Liberia.

Ms. Collins was unique in two areas. First, as a well-trained reading expert who undertook a reading program at Gordon College in Massachusetts in addition to earning a master's degree in the United States, she began the program with experience in thinking about how to improve the quality of reading instruction in Liberia based on sound principles of reading instruction. Second, she combined a wide range of pedagogical resources and ideas with persistence and passion that were infectious to the coaches. Several coaches, several principals, and many teachers noted that Ms. Collins had helped them think about how to teach better. In addition, she demanded that the coaches find ways to support the teachers, regardless of the obstacles that the program faced. The close relationships she had with the coaches, combined with the low coach-to-school ratios, allowed her influence to permeate the project more effectively than could have occurred in a larger program.

Decoding gains were key. At the pedagogical level, it appears that teaching children the ability to decode was an essential middle step to unlocking their fluency and comprehension levels. When asked about decoding strategies, teachers in control and light treatment schools were very unclear themselves on how to attack an unknown word, much less demanding this skill of their students. This was evident in the extremely low scores for control and light treatment children at the final assessment, where while gains occurred, the average child was still reading fewer than four words per minute. The scores for the full treatment children were still modest, at 15 words per minute, but represented the largest percentage increase (nearly 600%) of any task. This seems to be where the program took off, by providing children with at least basic and modest skills at decoding unknown and new words. This then allowed them to use context clues and other strategies to understand what was read. At the school level, several of the classrooms observed had examples of teachers using various methods to help children think about how to read a new word, whether through pocket charts or other methods.

Why Did Control and Light Treatment Outcomes Also Increase?

One question discussed in the EGRA Plus program quantitative analysis (Piper & Korda, 2011) is why the control and light treatment school reading outcomes improved between midterm and final assessment. It makes sense that the scores would increase between baseline and midterm assessment, since baseline was at the beginning of the first year (November 2008) and midterm was at the end of the first year (June 2009). It is less clear why the scores for control and light increased from midterm to final assessment (June 2010, end of the second program year), particularly when the gains from midterm to final often were larger than from baseline to

midterm. As a result, we also did follow-up research in two control and two light treatment schools.

Control schools' improvement and teacher deployment. For control schools, a few factors presented themselves. First, it appears that the control schools became aware that they would be assessed more than once—although the program design had precluded informing them as such—and they responded increasingly negatively to the EGRA Plus program assessing them without providing any support. This resulted in at least one control school refusing to participate in the final assessment. It is possible that this might have led to an improvement, given their interest in showing that they were also capable educators. Second, teacher attrition and transfer seemed to have an effect. One coach asked the District Education Officer if the district was purposely transferring teachers from full treatment schools to control schools as a response to the lack of support for control schools. Interestingly, the principal of the control school with the very largest increases from baseline to final assessment on oral reading fluency was initially the principal at a full treatment school and was transferred to a control school. Third, given the modest time commitments at each school for individual teachers, there were some teachers who worked in more than one school, and therefore are likely to have carried the techniques to the control school (if not the materials themselves). Fourth, an increased focus on reading in general in other USAID-funded education projects affected both the ALP schools and the schools in the ALP follow-up program, CESLY. CESLY eventually adopted many of the materials from EGRA Plus, but in its earlier stages, it provided material and teaching aid supports.

Note that we investigated whether there was a higher co-occurrence rate of ALP and/or CESLY in full treatment, light treatment, or control schools, and did not find one. However, there was an increased focus on reading from all of these programs, and many DEOs were interested enough in EGRA Plus to demand the program in more schools. This may explain why control schools improved, while at the same time being consistent with the fact that they improved much less than the full treatment schools. It is also a perfect illustration of why, in a situation where one cannot control the context, having a set of control schools is so important. At least if the other interventions are not correlated with the control vs. treatment factor, one can disentangle the effects of the key intervention from others in the environment.

Light treatment schools' improvement and assessment. When we examined why light treatment schools increased their reading outcomes, a few factors presented themselves. First, the community seems to have been engaged by the findings and the sharing of the school report cards. The community “responded positively” to the increase in scores, and through the program the focus on reading increased. As the principal of a light treatment school said, “Our kids could not read very well, not focused on reading. Now they are a ‘little bit interested’ in learning to read.” There was no evidence that the materials themselves were systematically transferred to light schools, but at one light treatment school (which had a large increase in student achievement), the new principal told us that he was frustrated enough by not getting any additional materials from EGRA Plus that he searched for other supplementary

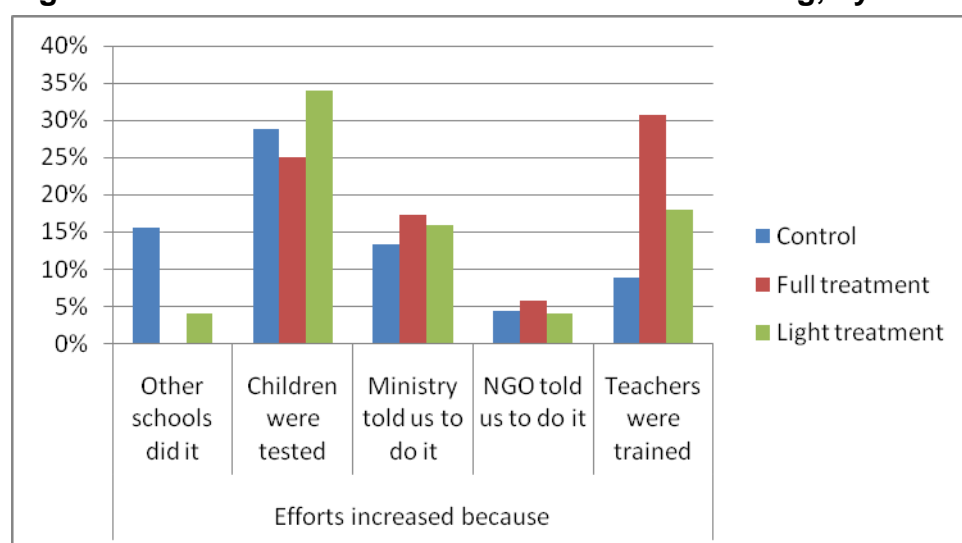
reading materials to increase the quality of reading instruction. All this means that the experiment was spoiled a bit, which makes the gains over control and light treatment that much more impressive.

In one coach's light treatment schools, he argued that the combination of the assessment and the training related to the assessment was a motivator. Even the couple of hours spent explaining why the assessment was being done presented new information to teachers and principals, resulting in some modest gains. Indeed, the light treatment principals and the coaches working with light treatment schools often noted that the assessment work increased attention and focus on reading.

This presents an interesting point: Simply spending more time and focus on reading can have some modest effect. However, to dramatically increase outcomes, training is necessary. This is an important distinction because in the Liberian case it was not simply a lack of motivation on the part of teachers or interest on the part of parents, although increases in both of those mattered a bit. What differentiated the light and full treatment schools in their gains were the techniques themselves. In other words, there does not appear to have been some hidden knowledge in how to teach reading that was lying dormant in teachers and could be accessed by simple accountability measures. Those help, but the real gains came from a program that taught teachers new techniques *and* provided significant support for the implementation of those new techniques in classrooms.

Testing various reasons for improvements across treatment groups. We asked teachers in all three groups of schools the reasons that their schools' efforts increased in reading (if they did). The responses are compared across control, full treatment, and light treatment schools in **Figure 10**. Control school respondents were most likely to say that they raised their level of effort because other schools were improving in reading, and they wanted to follow.

Figure 10. Reasons for increased efforts in reading, by treatment group

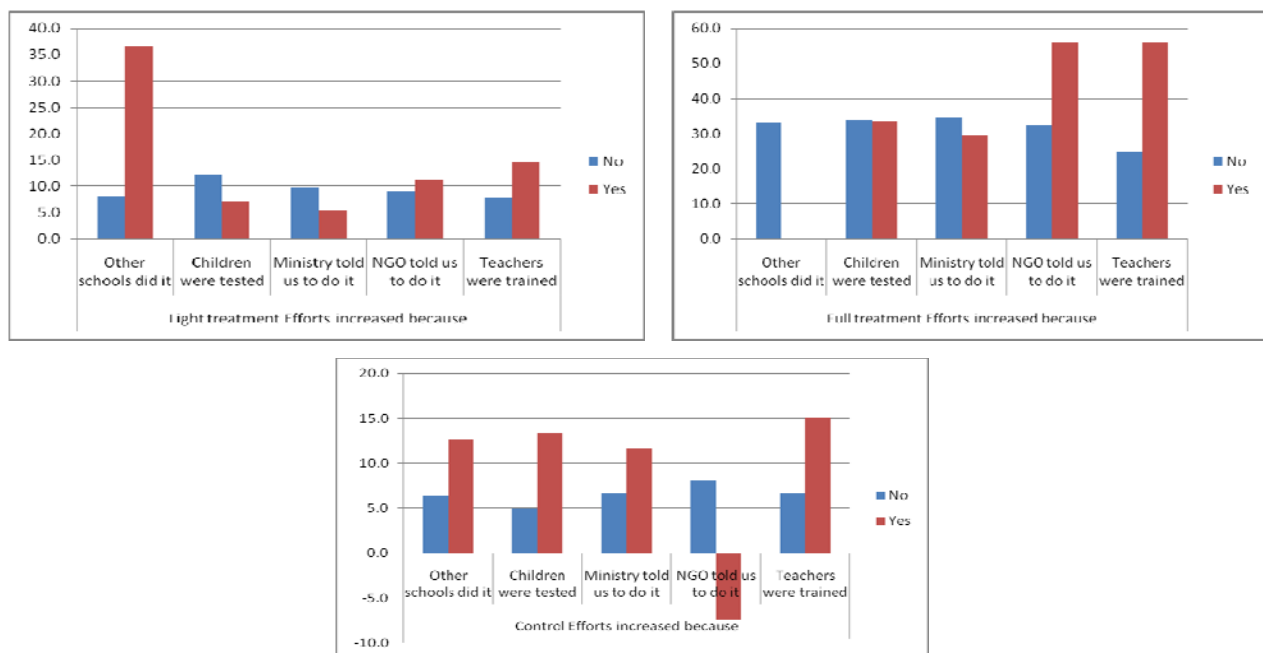


More than 25% of schools in all three groups said that their improvements were due to children being tested, with light treatment schools at the highest level, nearly 35%

of the schools. Several schools responded that their efforts were due to the emphasis on reading from the Ministry of Education and/or NGOs, but at similar frequencies across the three treatment groups. There were large differences by treatment group in the frequency of the final item, that increases were due to teachers being trained, with more than 30% of full treatment schools citing teacher training as the reason for improvements.

The frequency of the responses to these questions is less interesting than the oral reading fluency gains associated with each response. **Figure 11** associates those gains with the Yes or No responses to the various queries about why efforts increased, by treatment group. The top left panel shows the gains associated with full treatment schools. The biggest increases for Yes responses aligned with the NGO telling them to focus on reading and, most importantly, with teachers being trained. The act of having ongoing assessment of student outcomes and the influence of the Ministry had no impact, which is logical in full treatment schools, given the program design.

Figure 11. Oral reading fluency gains for schools citing various motivations for improvement, by full treatment, light treatment, and control schools



Light treatment schools (top right panel) showed the biggest differences in oral reading fluency gains around whether they were motivated by other schools' efforts. This is an interesting relationship, meaning that the greatest impact (as indicated by teachers and principals) was not from the accountability effect from testing (in fact, schools that cited that as a reason had a lower gain than those that did not), but from their interest in keeping up with what was happening in other schools.

For control schools, schools that increased efforts because of other schools working, children being tested, the Ministry's accountability, and teacher training (ostensibly from other programs, such as ALP or CESLY) had higher oral reading fluency gains than those that did not cite those reasons. On the other hand, schools that said their

increased efforts were from the accountability from an NGO had much lower (even negative) reading fluency changes.

This set of findings is somewhat surprising with respect to the literature on the ability of accountability to improve the quality of education. The schools that had cited an accountability motivation for improvements did no better (and often worse) in their improvements of reading outcomes. On the other hand, schools motivated by the increased quality of other schools improved much more significantly. This finding buttresses and explains the finding from the quantitative analysis that there was no statistically significant causal impact of light treatment on student outcomes.

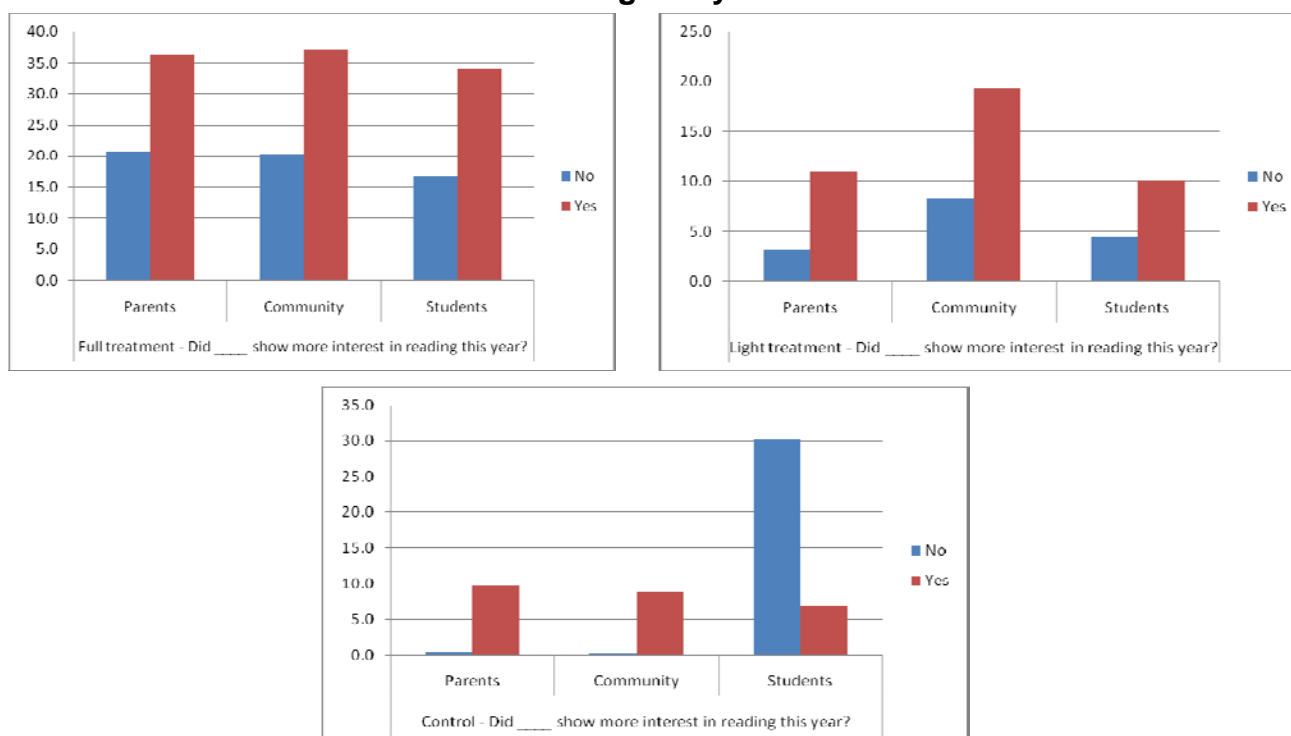
Apparently, motivation from neither the Ministry, NGOs, nor the testing of children was the correct lever to improve student achievement in this context.

Relationship between parental, community, and student interest and student outcomes, across treatment groups

This section presents the oral reading fluency gains, by treatment group, and by school response to the questions regarding whether parents, the community, and students were more or less interested in reading (*Figure 12*). For all treatment groups, for schools where parents and the community were more interested, oral reading fluency gains were higher. A similar finding could be said for the interest of students, except in control schools. Note that the 30 word per minute gain for the one school that said that children had less interest in reading than the year before was an outlier, and if it is removed from the analysis, the pattern is quite clear across all three groups. Where a program (as in the case of EGRA Plus) can encourage interest and engagement of the parents, community, and students, oral reading fluency scores also increase.

This response item was not able to establish the causal direction of this relationship, however. In other words, we are unsure whether it was the increased interest that was responsible for increased outcomes, or whether increased outcomes spurred on more interest in reading. However, it does provide some evidence that efforts to involve the community in the process of reading improvement can bear fruit. The magnitude of the effect of increased interest was much lower in light treatment schools than it was in full treatment schools, but the percentage magnitude was quite similar.

Figure 12. Oral reading fluency gains for schools depending on their responses to whether parents, community, and students were more interested in reading this year



Why Did EGRA Plus Increase Girls' Outcomes More Than Those of Boys?

The earlier analysis showed that while girls' scores were lower at baseline, they increased more at final assessment, such that the program effect was bigger for girls than for boys.¹⁰ The follow-up research investigated the reason this occurred. First, in all of the countries where RTI International has studied early grade reading using the EGRA, except for Liberia and Ethiopia, girls have outperformed boys. So it might be that gender relationships and preferences are slightly different in the former countries, and with differing classroom conditions, more girls might be involved in the discussion and do better.

We found that girls were just as likely to respond to questions in EGRA Plus full treatment classrooms as were boys. Other reasons for girls' lower performance in Liberia might include test anxiety for girls at the initial assessment, or additional chore responsibilities for girls. It is not clear, based on the brief follow-up research, by which mechanism girls' achievement increased. This gender issue is an important emphasis of further literacy activities, since it is critical to overcome any gender imbalance.

¹⁰ Note that while girls increased more, they did not score statistically significantly higher than boys at the final assessment. They increased more, but since they started from a lower base, their level became basically even with that of the boys.

Why Did the Program Increase Grade 2 Scores More Than Grade 3 Scores?

The quantitative analysis showed that the impact of EGRA Plus was larger for Grade 2 children than it was for Grade 3 children. This is somewhat surprising given that the children who were in Grade 3 in June 2010 at the final assessment had enjoyed two years of program effect. Reading outcomes were higher in Grade 3, of course, but the program's effect size was much smaller.

The qualitative follow-up research attempted to examine why this might have occurred. One obvious reason presented itself: The lesson plans were the same for Grade 2 and Grade 3, so the effect would obviously dissipate, and the dramatic gains in Grade 2 from a strong reading program would not be repeated in Grade 3, particularly because children in Grade 3 in 2009–10 had ostensibly already learned the program (although the training duration in this initial year was around four months). The Grade 3 teachers also seemed to be less enthusiastic about the program, although the causal direction for this isn't clear. That means that it might be that they were less enthusiastic because it did not work as well. On the other hand, it might be that they were less enthusiastic because they thought that it did not match well with the Grade 3 curriculum and what children are expected to know at that age.

Differentiating program materials by grade, increasing the difficulty of reading passages, and presenting more difficult methods to Grade 3 teachers are potential solutions to this problem. The ideal scenario, of course, is to increase the rate of reading acquisition so much that children can read after Grade 2, rather than after Grade 3, which would allow Grade 3 to be a “reading to learn” level. However, in Liberia, given that English is not the first language for many children,¹¹ care should be taken to ensure that they have the basics of reading acquisition in hand before they move away from instruction in foundational strategies for teaching reading.

Did the EGRA Plus Program Increase Student Enrollment?

In order to investigate whether the EGRA Plus program's impact was due to a limiting of the student population, thereby increasing the ability of the program to work with a smaller student population, we investigated whether and how the EGRA Plus program was associated with student enrollment. **Table 3** shows the differences in enrollment percentage gains for full treatment, light treatment, and control schools. Overall, enrollment increases in full treatment schools were 23.0%, more than 24% higher than in control schools; while enrollment increases in light treatment schools were 10.3%, more than 11% higher than in control schools. Neither change was statistically significant, potentially due to the small sample size.

¹¹ While English is technically a second language in Liberia, it serves in a slightly different capacity than does French in some of the neighboring countries. That is to say, generalizing broadly, Liberian English is much more of a lingua franca than French is for its neighbors.

Table 3. Differences in enrollment percentage increases against control (final enrollment – baseline enrollment)/baseline enrollment (*p*-values in parentheses)

	Grade 2	Grade 3	Boys	Girls	Overall
Full Treatment	32.8%	22.2%	28.8%	15.0%	23.0%
	(.08)~	(.38)	(.13)	(.56)	(.20)
Light Treatment	19.9%	6.8%	18.5%	27.5%	10.3%
	(.29)	(.79)	(.34)	(.30)	(.57)
Control	-3.0%	13.7%	-2.1%	10.9%	-1.1%

When disaggregated, the table shows that Grade 2 enrollment percentage increases (32.2%) were statistically significantly higher in full treatment schools at the .10 level. EGRA Plus not only increased student achievement, but also increased enrollment by around a third, at least in full treatment schools, during a time when control schools' enrollment declined slightly. This is evidence of at least one mechanism of change of the program: For Grade 2 children, enrollment grew quite significantly in program schools. Recall that the private school included in the qualitative assessment sample saw dramatic increases in its enrollment, which the respondents attributed to the community's perspective that EGRA Plus was teaching children how to read, and quickly. The gains were not statistically significant in Grade 3, interestingly enough, perhaps because of the community's perception that the program would not help older children as much, and because control school enrollments increased by 13.7% in Grade 3. Boys' enrollment increased by 28.8% over male enrollment in control schools, and while that was not statistically significantly different from control schools' male enrollment decrease of 2.1%, it is quite a large increase substantively.

The associated literature on class size suggests that higher enrollment decreases school quality, but in the EGRA Plus: Liberia case, enrollment can also respond to improvements in school quality. This is a critical finding for the program and others like it, in the context of the ongoing debate about how to increase enrollment for vulnerable populations in the long term: Children who might otherwise have dropped out of school were retained in full treatment schools because of the quality of the education that they received. School quality is a critical factor in increasing enrollment, even in the early stages of primary school.

Recommendations

This section discusses a few recommendations, many of which are mirrored in the full quantitative report (Piper & Korda, 2011). Prior to giving details on the recommendations, the overall assessment of the EGRA Plus project showed quite clearly that the combination of pedagogical supports and material inputs central to the design of the full treatment schools was extremely successful, particularly in

comparison to the accountability inputs integrated into both the full and light treatment schools. Therefore, the central recommendation is to scale up program designs that have similar sets of instructional and pedagogical inputs at their core. Policy makers in Liberia (and similar contexts elsewhere) should be wary of programs that use accountability measures as the central lever for improving instructional quality, since the findings show quite clearly that those types of measures are best done as an ancillary part of a more focused pedagogical improvement strategy, and even then, the impacts related causally to the accountability measures are likely to be modest. This appears to be because, when it comes to the technical skills of teaching children how to read in early primary, the failure of systems to do this successfully is not primarily due to the lack of incentives and community involvement that a set of accountability measures is best equipped to overcome. When children do not know how to read, it is essential to focus energies on providing the materials and lesson plans and pedagogical support necessary to show teachers how to teach children how to read. The rest of the recommendations fall into two broad categories: pedagogical and structural, and are presented below.

Pedagogical recommendations

The qualitative research revealed that the gains in reading fluency persisted after the final assessment, with full treatment schools reading more than 50 words per minute on average, at the beginning of the year, against only 17 words for control schools. This means that children in full treatment schools were reading three times as fluently. However, the observations show that much work remains to be done: While significant time was spent on improving students' phonological awareness skills, and the outcomes proved the benefit of that, too little work was done with decoding, text analysis, and development of comprehension strategies. Moreover, some of the observations revealed that where these more sophisticated strategies were employed, teachers had to depend very heavily on the lesson plan and teacher's guide to remember what should be taught next. In some cases, this dependency detracted from the quality of the pedagogy delivered.

Of course, these fundamental skills are a critical step in supporting children to crack the code of reading. USAID's Liberia Teacher Training Program, Phase 2 (LTTP2)—and other interventions—could respond by expanding the curriculum so that the next set of reading manuals would focus more on higher-level word study skills with an emphasis on morphology, while simultaneously developing vocabulary knowledge and oral and written comprehension skills. This shift is likely to improve the materials even more, so that there is more emphasis on meaning-based strategies, without lessening the focus on helping children crack the code quickly.

Structural recommendations

It is also notable that the two full treatment schools with lowest gains in oral reading fluency were the ones where the coach had to traverse significant distances to visit the school. Again, it is difficult to disentangle whether that means that the lower gains were due entirely to the distance itself, or whether schools that are farther from a town

(as these two are) are also different in ways that make it more difficult for an instructional model like this one to be successful. In any case, incentives could be built into the program to increase the feasibility of coach and governmental support for distant schools.

It is clear that EGRA Plus full treatment had a significant impact on student achievement. The logical next step is to scale up the implementation of the EGRA Plus model to other portions of Liberia, as is conceived under LTTP2. An additional question relates to whether the success of the program can be replicated at lower levels of coach-to-school support, as the LTTP2 program also is designed to do.

The findings also show that there is unmet demand for quality education: The program not only increased student outcomes, but also did so while increasing enrollment. Given the experimental nature of the program, we can argue that the program caused the increase in enrollment. This indicates that with school quality increases, an unexpected effect might be an increase in enrollment, or at least a decrease in early dropout and retention. Further research is necessary to investigate how the expected increases in student achievement might have enrollment effects that will be necessary to understand vis-à-vis teacher deployment and resource allocation.

Appendix 1. Protocols for Qualitative Assessment

Teacher Protocol

School:
District:
County:
School Type:

1. How often do you teach reading? Has that changed over time?
2. What are the best strategies for teaching reading?
3. What materials were most effective for teaching reading?
4. How do you teach children about letter sounds?
5. How do you teach children to sound out words?
6. What are some strategies/techniques you use to check for student understanding of the lessons you teach?
7. Tell me about the reading report card for your classroom. What information was most useful to you as a teacher?
8. Did the assessments have an effect on your instruction? If yes, how? If no, why not?
9. Has the EGRA Plus program changed how you teach other subjects besides reading?
10. How interested are the community members in the quality of reading instruction? Has that changed over time?

Rank order these 8 interventions based on how influential they were in improving reading outcomes:

- Materials (books) _____
- Lesson plans _____
- Student report cards..... _____
- School report cards _____
- Reading competitions..... _____
- Radio shows..... _____
- Coach support..... _____
- In-service teacher professional development _____

Principal Protocol

School:

District:

County:

School Type:

1. How often did you attend training for reading?
2. What were the important things that you learned about reading and reading instruction in the trainings?
3. How did you support your teachers in giving reading instruction to students?
4. How much class time is spent on reading now? Before?
5. What materials were most valuable in supporting reading improvements?
6. How effective were the lesson plans?
7. What were the results of sharing the school report cards?
8. Has instruction in other subjects changed at all? How?
9. Did the assessments have an effect on the quality of teaching and efforts of the teachers? How?
10. For light/control – did you have any materials or extra training from the full treatment schools? How did you obtain it?
11. What else do you want to tell me?

Rank order these 8 interventions based on how influential they were in improving reading outcomes:

- Materials (books) _____
- Lesson plans _____
- Student report cards..... _____
- School report cards _____
- Reading competitions..... _____
- Radio shows _____
- Coach support..... _____
- In-service teacher professional development _____

Protocol for Parents/PTA/Community Members

School:

District:

County:

School Type:

1. Is your child learning how to read well? How do you know?
2. Tell me what the reading report card tells you about your child's progress in learning to read.
3. Have you listened to any of the radio shows? If yes, what information was most helpful to you?
4. Did you attend the reading competition in your child's school? What did you learn?
5. How do you help your child at home with the reading homework?
6. Tell me about the school's reading report cards. What information did that provide to the community?
7. Tell me about the reading competition. What effect did that have on the community?
8. Do you think that your community school is teaching children to read more effectively? Why or why not?
9. Is there anything else you would like to tell me?

Coach Protocol

Schools:

District:

County:

School Type:

1. How often did you visit the schools?
2. Were there any schools that that you had an easier time of supporting than others?
3. How open were the teachers to the new ideas in the project? Were some schools more open?
4. How many lessons were you able to observe in a typical month? What were your observations like?
5. What were the areas that teachers found difficult to adopt? Easy?
6. What did you notice were the main differences between full treatment and light treatment schools?
7. Were there changes in the education system outside of EGRA Plus that had an impact on student achievement?
8. Were there any things that were used from either light or control schools that were from EGRA Plus?

Rank order these 8 interventions based on how influential they were in improving reading outcomes:

- Materials (books) _____
- Lesson plans _____
- Student report cards..... _____
- School report cards _____
- Reading competitions..... _____
- Radio shows _____
- Coach support..... _____
- In-service teacher professional development _____

DEO / Education Official Protocol

School:

District:

County:

School Type:

1. How has teaching reading changed over time?
2. Do you have EGRA Plus schools in your district? Are they effective? Why or why not?
3. Have other schools used the materials for EGRA Plus?
4. What other changes have there been to increase the quality of reading instruction in your district?
5. Do you think the changes from EGRA Plus are scaleable? Why or not?
6. What were your impressions of the reading competitions?
7. What did you think of the radio shows?
8. Is there anything else you would like to tell me?

Rank order these 8 interventions based on how influential they were in improving reading outcomes:

- Materials (books) _____
- Lesson plans _____
- Student report cards..... _____
- School report cards _____
- Reading competitions..... _____
- Radio shows _____
- Coach support..... _____
- In-service teacher professional development _____

Appendix 2: EGRA Oral Reading Fluency and Reading Comprehension Subtasks

Section 6a. Oral passage reading

Show the child the story in the student stimuli booklet. Say,

Here is a short story. I want you to read it aloud, quickly but carefully. When you have finished, I will ask you some questions about what you have read. Do you understand what you are to do? When I say "begin," read the story as best as you can. I will keep quiet & listen to you, unless you need help. Ready? Begin.



Start the timer when the child reads the first word. Follow along with your pencil and clearly mark any incorrect words with a slash (/). Count self-corrections as correct. **Stay quiet**, unless the child hesitates for 3 seconds, in which case provide the word, point to the next word and say "Please go on." Mark the word you provide to the child as incorrect.

At 60 seconds, say "Stop." Mark the final word read with a bracket (]).

Early stop rule: If the child reads no words correctly on the first line, say "Thank you!", discontinue this exercise, check the box at the bottom of the page, and go on to the next exercise.

My name is Pat. I live on a farm with my mother, father, and brother Sam.

Every year, the land gets very dry before the rains come. We watch the sky and wait.

One afternoon as I sat outside, I saw dark clouds and then something hit my head, lightly at first and then harder.

I jumped up and ran towards the house. The rains had come at last.

Section 6b. Reading comprehension

When 60 seconds are up or if the child finishes reading the passage in less than 60 seconds, **REMOVE the passage from in front of the child**, and ask the first question below.

School:

District/County:

School Type:

Grade:

Gender:

Now I am going to ask you a few questions about the story you just read. Try to answer the questions as well as you can.

		Correct	Incorrect	No Response
16	Where does Pat live? [On a farm; with family]			
33	Why does the land get dry? [The rains haven't come; there is a drought; God doesn't send the rain]			
	Why do Pat and his family watch the sky? [Hoping the rains come]			
55	What hit Pat on the head? [rain; water]			
69	How do you think Pat felt when the rains came? [Excited, thankful, happy, any reasonable answer]			

Time remaining on stopwatch at completion (number of SECONDS):

Check this box if exercise stopped due to no correct answers in the first line.