

SummerREADS/ Library Program Evaluation Report: Summer 2014

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Executive Summary

Research has shown that lower socioeconomic status and minority students experience greater losses in academic achievement than their more affluent and majority status peers during the period of summer vacation. It has been hypothesized that differential summer learning likely occurs when more advantaged children continue to have access to educational resources and learning experiences due to their socioeconomic status and environments in the family and neighborhoods, while their less affluent and disadvantaged peers do not have access to the same amount or type of learning resources. Summer learning loss is especially of concern in large urban districts like Baltimore City that serve a large socio-economically disadvantaged population of students.

To address the summer learning resource and learning gap, during the summer of 2014 the Abell Foundation in partnership with the Harry and Jeanette Weinberg Foundation Library Project (Library Project), Baltimore City Public School System (City Schools), the Maryland Out-of-School-Time Network (MOST), and Reading Partners developed a program to provide more robust opportunities for children to access books and literacy activities during the summer. The project combined the provision of a self-selected library of 12 books (SummerREADS) with improved access to books, literacy opportunities and enrichment activities through the opening of six state-of-the-art school libraries renovated as part of the Library Project during the summer of 2014.

Overall, the combination of the provision of a self-selected library of books with increased summer literacy opportunities appears to have had a positive effect on students’

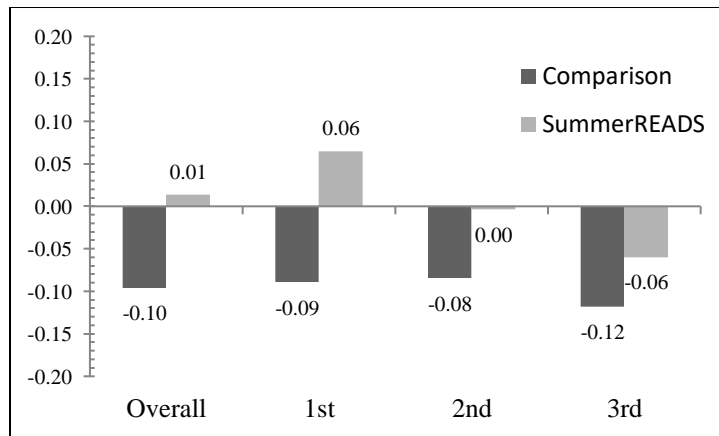
summer learning relative to a matched comparison group of students who did not receive books or were not actively given the opportunity to participate in the summer program and Library Program libraries. Students in the program on average scored 2.45 points higher in fluency (effect size = .07) and 2.19 points higher in accuracy (effect size = .12) on district beginning of year benchmark reading tests than comparison students. The magnitudes of these effects are similar to those found in evaluations of similar programs. Further, performance on these benchmark measures of reading fluency have been shown in the research literature to be positively associated with a student's performance on end-of-year standardized reading assessments used by states for accountability purposes. Thus, increasing students' beginning-of-year scores is important as it likely increases the probability that students will reach proficiency by the end of the year as measured by standardized assessments.

It is important to note that across the sample, on average students appear to have lost ground in reading during the summer; however students who were given the program experienced smaller losses on average than comparison students. As Figure i below illustrates descriptively, the program appears to have had similar positive effects across grades; however the composition of that effect was qualitatively different. While rising 1st graders appear to have on average made gains in learning over the summer, 2nd graders maintained learning during the summer (e.g., no gain or loss), and 3rd graders lost ground but to a lower degree than comparisons.

This positive finding stands in contrast to previous implementations of the SummerREADS portion only that failed to find significant effects on reading achievement over the summer but did find longer term positive effects of the program on student performance at the end of the school year following the book distribution. The 2014 program represented a

significant expansion of the previous implementations of SummerREADS in terms of greater family engagement, increased marketing and communication about the program and increased opportunities for students to engage in literacy activities over the summer. While it cannot be known with certainty, it is likely that these enhanced components lead to greater utilization of the SummerREADS books in meaningful ways than occurred in previous years. Future implementations of this program in Baltimore should continue to strengthen and refine parent engagement and opportunities for students to engage in literacy activities during the summer as these components are likely the catalysts for increased literacy resources to have an effect on students' summer learning.

Figure i. Descriptive comparison of standardized summer gain (loss) in *fluency* by group and grade



Note. Standardized Gain was calculated by subtracting the district-wide mean score from the Fall and Spring raw scores and dividing by the appropriate grade level district level standard deviation and then taking the difference between Spring and Fall. These standardized gain scores illustrate how students moved in the distribution of scores over the course of the summer. All estimates are unadjusted for student and school characteristics and should not be interpreted as the causal effect of the program.

Introduction

In the idealized vision of summer vacation students take a break from the rigors of the school year and take time to relax and play. However it has been well established in the research literature that students' learning growth can slow, remain unchanged or even decline during the summer. Especially challenging for urban districts and schools is the finding that socioeconomically disadvantaged students generally experience greater losses in academic performance during summer break than their more advantaged peers.¹ These summer losses have been implicated as a major contributing factor in socioeconomic achievement gaps.² The summer represents a potentially dramatic change in context for disadvantaged children as they no longer have the academic, social, and resource supports provided by the school and must rely solely on the supports available in their families and communities.³

In recognition and in response to this need, the Abell Foundation, Inc. in 2011 began implementing the Baltimore SummerREADS book distribution program. The program was modeled on the successful voluntary summer reading and book distribution programs designed and implemented by James Kim at Harvard University and colleagues.⁴ From 2011 to 2013 Baltimore SummerREADS provided 2nd and 3rd grade students in high poverty, extremely low performing Baltimore elementary schools with a set of 12 developmentally appropriate books as well as training (for teachers and parents) in comprehension and reading fluency strategies intended to provide students and families with self-support learning tools for the summer.

¹ e.g. Heyns, 1987; Cooper, Nye, Charlton, Lindsay & Greathouse, 1996; Entwisle, Alexander & Olsen, 1997; Burkham, Ready, Lee & LoGofero, 2004; Downey, von Hippel & Broh, 2004

² Alexander, Entwisle & Olsen, 2007

³ Entwisle, Alexander & Olsen, 2001; Slates, Alexander, Entwisle & Olsen, 2012

⁴ e.g. Kim, 2006; Kim & White, 2008

Evaluations of SummerREADS over the course of three years of implementation found no evidence of short-term effects of the program on students' achievement after returning to school in the fall after the summer but did find suggestive evidence of longer term effects at the end of the school year immediately following the summer of book distribution. Findings indicated that the provision of books alone did not appear to be sufficient to engender short-term effects on student academic performance over summer vacation however the program appeared to induce spillover effects into school year instruction.

Given these findings, during the summer of 2014 the Abell Foundation partnered with the Harry and Jeanette Weinberg Foundation Library Project (Library Project), Baltimore City Public School System (City Schools), the Maryland Out-of-School-Time Network (MOST), and Reading Partners to provide more robust opportunities for children to access books and literacy activities during the summer by utilizing six state-of-the-art school libraries renovated as part of the Library Project. It was hoped that coupling the provision of a self-selected library of 12 books (SummerREADS) with improved access to books, literacy opportunities and enrichment activities through the opening of the Library Project libraries during the summer would lead to stronger program effects on children's summer learning loss than was realized in previous implementations.

Program Characteristics

The SummerREADS portion of the program was designed to provide a self-selected library of 12 books at reading level to all K-3rd grade students in six Library Project schools to take home at the end of the school year. This was combined with a summer Library Program that provided opportunities for students and families to access books and literacy and enrichment

activities in the renovated Library Project libraries four days a week (Monday through Thursday) from June 23rd through August 7th, 2014. The program was also supported by a robust communications strategy that advertised and promoted the program through traditional and social media outlets (e.g., Facebook). Specific program elements are discussed below.

SummerREADS

The program was modeled on the successful voluntary summer reading and book distribution programs implemented by James Kim and Thomas White as detailed above.⁵ These programs provide students with a set of developmentally appropriate books as well as training in comprehension and reading fluency strategies intended to provide students with self-support learning tools for the summer. The following discussion provides an overview of the SummerREADS program as implemented in Baltimore during the summer of 2014.

Teacher training and end-of-year lessons. Teachers in the targeted grades at program schools participated in a two-hour orientation session during April that covered the impetus and rationale for SummerREADS, reviewed program logistics, and trained teachers on the end-of-year lessons. Teachers were compensated for their time at the normal district rate for professional development hours.

The end-of-year lessons focused on oral reading and comprehension strategies and were adapted from those used by James Kim and colleagues by the City Schools' Director of Humanities in coordination with the SummerREADS project. The lessons intended to teach students strategies to maintain reading comprehension over the summer including re-reading for fluency improvement. Teachers were given a storybook and all necessary materials for the

⁵ Kim, 2006; Kim & White, 2008

lessons (e.g. copies of all student paper materials, book for the lesson, parent letters and translations into native languages for English language learners) and were asked to implement the two designated lessons at end of the school year. They were also provided with materials and guidance to help assign students to book selections by reading level.

Book fairs. Book fairs were conducted at study schools approximately one month before the end of the school year by the SummerREADS program in conjunction with Scholastic Inc., a well-known publishing, education and media company. Teachers brought their students in classes to the school library where they received a short orientation on how to choose their books. Individual students were directed to a table that contained selections at the child's reading level and had 15-20 minutes to choose their 12 books from a group of approximately 50 high interest fiction and non-fiction titles. If students were unable to find a desired book at their reading level table, they were allowed to select books from tables that were one reading level above or below their own. Students selected 11 titles and were also given a common book by grade level (aligned to a Common Core topic). These books were held by the teachers for distribution at Family Nights held typically later that day.

Family literacy nights. The evening of the book fair, program schools conducted a family literacy night that provided an orientation to the program for students and families. These family literacy nights were intended to get families and students excited about the summer program as well as provide information to parents and guardians regarding the various hours and activities at the Library Program sites during the summer. In order to induce higher participation, a meal was provided for all attendees. Following the meal, participants were asked to work their way around "stations" which highlighted different aspects of the program. For example, stations included completing emergency contact forms, family reading ideas, partnership overviews, and

sample Library Program activities. After completing the stations participants were able to pick up the books and book bag that were selected by students during the book fairs.

In comparison to previous years of SummerREADS implementation this component was more standardized across sites and was more robust in its offerings to parents. The family literacy nights in 2014 had significantly higher rates of participation than parent orientations in the first three years of SummerREADS. A total of 414 adults representing 532 students (1/3 of the 1,602 students enrolled in SummerREADS schools in grades K through 3rd) participated in the family literacy nights across the six program sites in 2014. Students whose parents did not participate in a family literacy night received their books at school the following day.

Summer Library Program

The summer library program was designed to leverage the Library Project libraries to provide a safe and welcoming space where community partners could provide students and families with numerous tools and opportunities to promote academic achievement during the summer months. Staff from MOST worked with school administrators to develop site specific rules and protocols prior to the beginning of summer.

Staffing. Each program site was staffed by a school staff member (Librarian or Library Clerk) and up to two AmeriCorp VISTA members during the summer. MOST staff members were responsible for facilitating enrichment programming from community partner organizations, while school staff managed the school library facilities. AmeriCorp VISTAs were tasked with helping during partner programming, helping students use the library and helping with collecting daily attendance and participation data. AmeriCorp VISTAs were supervised by MOST staff members.

Enrichment programming. Various community partners provided literacy and STEM focused enrichment activities at each site during the summer. These activities were intended to provide enrichment to students as well as enticements for students to use the libraries during the summer. These activities were intended to take place at least twice a week at each site and in practice occurred almost daily at most sites. Following are some examples of enrichment activities that occurred during the summer.

FutureMakers taught students about engineering through creating their own unique "drawbots" constructed from cups, markers, batteries, LED lights, and motors. At the end of the activity each child had a working robot.

Blue Water Baltimore facilitated children's environmental awareness of water quality and pollution in the Chesapeake Bay through an interactive reading activity where children dumped various pollutants into a model watershed as the facilitator read the story "Who Polluted the Bay?" As the story progressed the children could see how the pollutants changed the once clear model bay.

Scientists from the *Space Telescope Science Institute* presented a workshop about the solar system. Students learned about all of the planets and other space objects (e.g., asteroids, comets). Students then created their own "undiscovered" planets.

Students learned about creativity and biology during an activity facilitated by *Art with a Heart*. Students learned about ocean conservation and self-expression by creating mixed media representations of the main character in the story “I’m the Biggest Thing in the Ocean.”

In total 11 community partners provided 142 enrichment activities at the Library Project Libraries during the summer.

Reading Partners. *Reading Partners, Baltimore* provided support to the library sites through direct planning with staff of the content of partner workshops and training of AmeriCorp VISTAs on literacy and literacy development. Reading Partners also provided indirect support by informing their volunteer tutor force about opportunities to volunteer in Library Project Libraries during the summer.

Meal program. Most library sites were also a summer meals feeding site. Breakfast and lunch were available to all youth under the age of 18 in the area. Students were not required to participate in either the meals program or the library program but it was hoped that by co-locating the two programs that students participating in the meals program would naturally explore the library program and vice-versa.

Method

This section provides details on the design of the evaluation of the implementation of the 2014 SummerREADS/Library Project program in Baltimore. The evaluation was designed to examine the potential of the combination of the SummerREADS program with increased summer opportunities for literacy enrichment to support student reading during the summer. Specifically this evaluation report focuses on the following main evaluation question:

How do reading gains of students who participated in the SummerREADS/ Library Program differ over the course of the summer from a matched comparison sample of peers who did not participate in the program?

A second set of evaluation questions were created to explore the potential effect of actual attendance at the Library Program on summer learning. Specifically I focus on the following questions:

Who attended the summer Library Program? How did attenders differ from non-attenders in terms of demographic and academic characteristics?

What is the relationship between participation in the Library Program and student achievement gains in reading over the course of the summer?

I begin with a discussion of the method used to address the focal evaluation question followed by a discussion of the methods used for the second set of evaluation questions.

In order to identify the potential effects of the SummerREADS/ Library Project on student reading achievement growth identifying a group of children who were not exposed to the

project during the summer of 2014 was necessary. The strongest causal estimates of this effect would come from randomly assigning schools to implement the program or not and then estimating group differences between children in implementing schools with those in non-implementing schools. Since a randomized, experimental design was not possible for this project, other quasi-experimental methods were used to create a counterfactual comparison group that has the potential to lead to valid estimates of the effect of the program on students.

This evaluation uses a two-tiered matching strategy to identify a valid comparison group. In the first phase, participating schools were matched to non-participating schools based on programmatic similarity. In the second phase a pre-analysis matching technique known as *coarsened exact matching* (CEM) was used to create a comparison group of students from non-participating schools that are similar to students in implementing schools on observable characteristics. The details of this matching process are discussed below.

School and Student Sample

Implementing schools. A total of six schools that served elementary grades participated in the SummerREADS/ Library Project program in the summer of 2014. These schools were selected based on the fact that their school libraries had already been renovated as part of the Baltimore Elementary and Middle School Library Project. Two implementing schools do not participate in the district's benchmark testing program⁶ and were excluded from the evaluation due to the lack of student achievement data. The remaining four schools⁷ served as the focal group of implementing schools.

⁶ The Historic Samuel Coleridge-Taylor Elementary School and Southwest Baltimore Charter School)

⁷ Arlington Elementary/Middle School, Elmer A. Henderson: A Johns Hopkins Partnership School, Moravia Park Elementary School, Thomas Johnson Elementary/Middle School

Comparison schools. In the first phase of matching, I identified a pool of non-implementing schools that were scheduled to open Library Project libraries but had not completed renovations by the summer of 2014 or had received funding for library renovations through an external funding stream (Qualified Zone Academy Bonds [QZAB]) in 2013 but did not have additional programmatic funding or support through the Library Project. This constraint was applied in order to account for potential unobservable differences between schools that may be related to the schools' ability to secure Library Project funding or similar funding for library renovations and their effects on student achievement. A total of seven schools were identified as comparison schools.⁸

Student matching. In the second phase, students who were enrolled in an implementation school at the end of the 2013-14 school year were matched with comparison students who did not participate in the program from the pool of identified comparison schools. Students were matched using a CEM technique that matches students based on observable characteristics including race/ethnicity, participation in special programs (English language learner, special education, free and reduced priced meals), and measured achievement on academic tests.

The goal of matching was to control for pretreatment characteristics that might bias estimates of the effect of the program. For example, if students in implementing schools had better reading achievement prior to receiving books compared to students in non-implementing school, then a naïve comparison of these students could erroneously ascribe positive effects to the program when in fact the effect could be due in part to pretreatment differences in the groups.

⁸ Two of the seven comparison schools were Library Project schools that had yet to complete renovations (Harford Heights Elementary School and Windsor Hills Elementary/Middle School) the remaining five schools received QZAB funding only (Gilmor Elementary School, Harlem Park Elementary/Middle School, James Mosher Elementary School, Liberty Elementary School, Sinclair Lane Elementary School)

Matching students on pretreatment characteristics potentially avoids this difficulty by balancing those characteristics between the two groups.

In CEM, each matching variable is recoded into groups of values that are substantively identical much in the same way that a continuous variable (e.g., scores on an achievement test) can be grouped together into bins to create a histogram. This is the coarsening step and is conducted across all variables in the matching equation. Next CEM creates stratified sets of treated and comparison students based on the coarsened variables. Treated and comparison students are then matched within strata; treated and control students within strata without a potential match (e.g. a treated student within a strata with no comparison students) are discarded from the sample. While this procedure potentially eliminates or reduces pretreatment imbalances across groups on the variables used in the matching process it cannot rule out unobserved group differences that may lead to biased estimates of the program effect. Despite this, the procedure does lead to stronger inferences than are possible in the absence of matching. Results of the matching procedure are discussed in the *Analytic Samples* section below.

Data

Data for the evaluation came from several sources. Student demographics, achievement, and other administrative data (e.g. school year attendance) came from City Schools' administrative data files that were obtained through the Baltimore Education Research Consortium (BERC). School characteristics were downloaded from the Maryland State Department of Education Maryland report card website.

Measures of student reading. City Schools implements the Amplify mClass suite of benchmark testing for progress monitoring of Kindergarten through 4th grade reading

achievement. These benchmark tests are administered in three windows during the school year by classroom teachers to all of their students, including testing at the beginning and end of the academic school year. mClass data were collected for the spring and fall of 2014 for all rising 2nd, 3rd and 4th grade students who were enrolled in SummerREADS and comparison schools. Rising 1st graders were not included as the tests for kindergartners are different than those given to older students.

Included in the suite of mClass assessments is the DIBELS Oral Reading Fluency (DORF) which is “a measure of advanced phonics and word attack skills, accurate and fluent reading of connected text, and reading comprehension” and is composed of two parts; oral reading fluency and passage retell. On the oral reading fluency component students are given an unfamiliar, grade-level passage and are asked to read for one minute. Students are scored on the total number of words read correctly and the total number of errors made (e.g. substitutions, omissions and hesitations lasting longer than three seconds). For benchmark testing students complete the activity three times and the median words correct and errors are used as the student’s score.

The DORF measures can be used by teachers to identify students with potential reading problems and also as benchmarks for measuring student reading progress over time.⁹ Several studies have also found that oral reading fluency scores are moderate predictors of student reading proficiency on state end of year proficiency tests.¹⁰ Student DORF scores serve as the

⁹ Good, R. and Kaminski, R. (2011). DIBELS Next Assessment Manual. Dynamic Measurement Group, Inc.

¹⁰ See Baker, S. K., Smolkowski, K., Katz, R., Fien, H., Seeley, J., Kame’enui, E. J., et al. (2008). Reading fluency as a predictor of reading proficiency in low-performing, high-poverty schools. *School Psychology Review*, 37(1), 18-37.; Shaw, R. & Shaw, D. (2002). DIBELS Oral Reading Fluency-Based Indicators of Third Grade Reading Skills for Colorado State Assessment Program (CSAP). (Technical Report) Eugene, OR: University of Oregon; Buck, J. & Torgesen, J. (2003). The Relationship Between Performance on a Measure of Oral Reading Fluency and Performance on the Florida Comprehensive Assessment Test. (FCRR Technical Report #1) Tallahassee, FL: Florida

main outcome of interest for the evaluation. Following is a brief discussion of each submeasure component of the DORF used in this evaluation.

Fluency is the median number of words correctly identified per minute over the course of three one-minute passage readings. The measure takes the value of zero in cases where the student is unable to read any words correctly on the first line of the passage.

Accuracy is a measure of the percentage of median words correctly spoken (fluency) by a student out of the total median words attempted over the course of the three oneminute passage readings and is calculated as:

$$Accuracy = 100 * \frac{median\ words\ correct}{median\ words\ correct + median\ errors}$$

The measure has a minimum score of zero (no words correct) and a maximum of 100 (all words correct).

Student demographic data. Student demographic data for SummerREADS and comparison students was obtained from City Schools and merged with student achievement data. Key student characteristics obtained from this data included student race, gender, FARMS status, special education status, limited english proficiency status, and attendance during the school year prior to SummerREADS participation

Participation data. Program administration data was used to identify students who participated in the program. Students who received books throught the SummerREADS portion of the program were identified from classroom rosters (student unique identifiers only) provided

Center for Reading Research; Barger, J. (2003). Comparing the DIBELS Oral Reading Fluency indicator and the North Carolina end of grade reading assessment. (Technical Report). Asheville, NC: North Carolina Teacher Academy.

to SummerREADS by the participating schools. These rosters were matched to City Schools' demographic data using City Schools' unique student identification number. Library Project libraries utilized an electronic roster system created by Cityspan that captured daily attendance and was matched to City Schools' data using unique student identifiers.

School characteristics. Data from the Maryland State Department of Education Maryland report card website was downloaded and merged to student data based on the school of enrollment at the end of the 2013-14 school year. From this data I created two school level control variables; the percentage of elementary grade students scoring proficient or advanced on the 2013 Maryland School Assessment (MSA) reading test¹¹ and the percentage of elementary students who were classified as chronically absent during the 2013-14 school year.

Analytic Sample

CEM was conducted on the full sample of students who were enrolled in one of the four implementing schools and the four matched non-implementing schools at the end of the 2013-14 school year (n = 1153; 496 non-implementing, 657 implementing). Variables used for matching included: student race/ethnicity (African American, white, Latino, other), gender, free and reduced meals status (FARMS), special education status, grade level at end of 2013-14 (1, 2, 3), an indicator of chronic absence in 2013-14 (student was absent for 10% or more days enrolled in school), an indicator of school transfer during the year, and student achievement on the DORF fluency and accuracy measured at the middle-of-year and end-of-year 2013-14 school year

¹¹ The 2013 administration of the MSA was used because in the 2013-14 school year Maryland was transitioning from the MSA to the Partnership for Assessment of Readiness for College and Careers Assessment (PARCC). As part of this transition schools had some students take the MSA while others took the PARCC. Given this I used the 2013 MSA as it is less likely to be contaminated by implementation issues stemming from the transition.

benchmark assessments. The prior achievement variables were coarsened to represent the categories of well below benchmark, below benchmark and benchmark.¹²

After CEM was conducted on the full sample a total of 410 SummerREADS students were matched to 574 comparison student in non-implementing schools. Students who were not matched were dropped from the sample (n = 540; 247 SummerREADS, 293 comparison). As shown in Table 1 (columns 1 and 2), SummerREADS and comparison students in the full sample exhibited imbalance prior to matching on the end-of-year (prior to the summer) on the DORF fluency and accuracy scores; SummerREADS students generally showed higher prior achievement across grades. After matching, differences between groups on these measures exhibited better balance (Table 1, columns 3 and 4). Examining the unmatched group of students who were dropped from the sample (Table 1, columns 5 and 6) shows that the improved balance was achieved by dropping comparison students at the lower end of the range on these scores who did not have matches in the SummerREADS implementing group. Table 2 illustrates the achieved balance in the matched sample for student demographic and administrative variables. Of note is that while the matching process achieved balance on racial demographics between groups it failed to find matches for white students in the full sample of SummerREADS students. This stems largely from the fact that comparison schools enrolled a significantly smaller number of white students than implementing schools. The imbalance between groups on the indicator for chronic absenteeism in the full sample was reduced by the matching process however there still remained a degree of imbalance on this measure between groups.

¹² I conducted several iterations of the level of coarsening for these variables to determine the level that maximized balance between groups on these variables and the number of treatment students retained. Finer grained coarsening on these variables (more strata) achieved balance but discarded too many treatment students.

Because CEM removes treated students who do not have matches from the sample and the composition of the matched analytic sample differs in substantively meaningful ways from the full sample the estimated effect of the program is the effect of the program “averaged over only the subset of treated units for which good matches exist among available controls.”¹³ This means that the estimated effect of the program is generalizable to the group of matched students, not the full sample (all students in the implementing and comparison schools).

Analytic Model

The preferred method for estimating the potential effects of SummerREADS on student reading is hierarchical linear modeling (HLM) which can account for the fact that students are nested in schools. However, due to the limited number of second level units (schools) I am unable to implement HLM to estimate potential program effects. Therefore I estimate these effects within an ordinary least squares (OLS) multiple regression framework.

For each DORF measure (fluency, accuracy) I modeled a student’s beginning-of-year score (end of summer) as a function of the student’s end-of-year and middle-of-year fluency and accuracy scores to account for differences among students in reading performance prior to the summer. Student demographic and administrative variables that were used in matching were also included in these models as well as indicators for each school level matched pair to account for potential variability across pairs of schools related to the characteristics of those schools. To capture summer processes or activities that might influence a students’ summer learning loss outside of the program I included dummy variables that captured participation in City Schools’ summer reading academy and whether a student made a school transfer over the course of the

¹³ Iacus, King, & Porro, 2012

summer. The school level indicators were also included to capture school differences in achievement and chronic absenteeism that may be related to student reading outcomes.

Finally I included indicators for SummerREADS and attending the Library Program during the summer. Estimates of the SummerREADS indicator are the estimates of interest for this evaluation and can be interpreted as the average effect of SummerREADS on the beginning-of-year outcome, controlling for student and school characteristics within the sample of matched students. Estimates of the Library Program attendance indicator cannot be interpreted as a causal effect of attending the Library Program as comparison students had little to no probability of attending and the matching process did not account for attending the program. The estimate on this indicator likely contains unobserved bias (e.g., an unobserved characteristic that is related to a student attending the summer program and related to summer learning) and should only be considered as a control variable. Models were estimated for both the matched analytic sample and the unmatched, full sample to provide a point of comparison.

Library Program Attendance

The analytic sample described above is valid to estimate the effect of receiving SummerREADS books and being offered the summer Library Program however it is not valid for estimating the effect of attending the summer Library Program on summer learning loss. This is because the Library Program was voluntary and only offered to students in implementing schools; potential comparison students in non-implementing schools had no opportunity to participate in the summer Library Program.¹⁴ Because all or most students at comparison schools were not offered the opportunity to attend the summer Library Program, and had no opportunity

¹⁴ This is not strictly the case as some sites were open to any child within the wider community. However, marketing and communications about the program were targeted expressly to students within implementing schools. It is likely that students outside of these schools would have a much lower likelihood of being aware of the program.

to attend, we cannot assume that matching students in implementing schools to non-implementing schools will adequately balance the groups.

Given this, I constructed a second analytic sample to investigate the potential effect of attending the Library Project program on summer learning loss. First, using program attendance records I identified students who attended the summer Library Program at least one day, who were in a focal grade (K, 1, 2, 3) and for whom a valid City Schools' unique student identifier was recorded. I then matched these records to City Schools' data based on the unique student identification number.

From a total of 345 students in the daily attendance records I was able to match 192 (56%) to City Schools' data (grades K-3) representing approximately 12% of K-3 enrollments in the implementing schools at the end of the 2013-14 school year.¹⁵ I then attempted to match this data to reading achievement data. This process was only able to successfully match 70 students.¹⁶ This large amount of missing data led to the discontinuation of pursuing the second set of research questions given above as analysis of this data would not provide valid estimates of program effects. In the *Findings* section below I only present basic demographic descriptive comparisons of the 194 students who were identified as attending the summer program to those who were not identified as attending. These comparisons provide some information that may be useful for future program planning but should not be considered causal owing to the large proportion of missing data.

¹⁵ All students who were unmatched were missing unique identifiers in the daily attendance records.

¹⁶ 55 kindergarten students were dropped for missing achievement data. 51 additional 1st – 3rd grade students were dropped from Samuel Coleridge-Taylor and Southwest Baltimore Charter School due to these schools not using mClass tests. The remaining 16 students were not retained for a variety of reasons, primarily for incomplete testing records (e.g., missing the end-of-year or beginning-of-year scores).

Findings

How do reading gains of students who participated in the SummerREADS/ Library Project differ over the course of the summer from a matched comparison sample of peers who did not participate in the program?

A statistically significant, positive effect of SummerREADS on beginning-of-year reading achievement was estimated in the matched analytic sample for both DORF fluency and accuracy. Among students in the matched sample, students who received SummerREADS had on average beginning-of-year fluency scores 2.45 points higher ($p < .1$, effect size = .07) than comparison students who did not receive SummerREADS net of prior achievement and other student characteristics (Table 3, column 2). This estimate is of similar magnitude to those found for similar interventions of this type. This estimate is smaller in magnitude from the estimate of SummerREADS in the unmatched full sample (Table 3, column 1) and illustrates the likely importance of pre-analysis matching in balancing student characteristics. SummerREADS was related to 2.19 point higher ($p < .05$, effect size = .12) average beginning-of-year accuracy compared to controls, net of student characteristics in the matched sample (Table 3, column 4).

The analysis above tells us that SummerREADS students on average scored higher on the beginning of year benchmark tests than comparison students who had similar end of year benchmark test scores. It does not however provide a characterization of gains or losses over the summer; it tells us that SummerREADS students performed better than comparisons but does not tell us if they gained, lost or stayed the same on these metrics over the summer. To provide this characterization Figure 1 presents comparisons of raw score (panel a. and b.) and standardized gains (panels c. and d.) between groups on the two outcome measures of interest (fluency and accuracy) both overall and across grades for the matched sample. Given similar patterns across

outcome measures and for sake of brevity, I limit the following discussion to fluency (panels a. and c.).

The raw scores in Figure 1, panel a. were calculated by subtracting students' end of the year raw score from the beginning of year raw score. While the group differences presented should not be interpreted causally¹⁷ they do provide a picture of how students' scores changed over the summer. Overall, students in both groups lost ground during the summer but the loss was on average less in the SummerREADS group (first set of bars, Figure 1, panel a). The SummerREADS advantage is consistent when broken out by student grade level. Of particular note is the difference between 1st grade students and students in grades 2 and 3.¹⁸ First, losses are more pronounced for 2nd and 3rd graders in both groups compared to the 1st grade. Second, SummerREADS 1st graders appear to have made a gain in fluency during the summer while the comparison students exhibited a loss.

The standardized scores in Figure 1, panel c were calculated by first standardizing students' end of year and beginning of year raw scores by subtracting the appropriate district-wide, grade level mean score and dividing by the appropriate district-wide, grade level standard deviation. The difference was then taken between these two standardized scores. These standardized gain scores illustrate how students moved in the distribution of scores over the course of the summer. For example a student who scored higher (lower) in the distribution of scores in the beginning of the year relative to where they scored in the end of year distribution would have a positive (negative) standardized gain score; a student who scored at the same point

¹⁷ These group averages are unadjusted for student characteristics. Further, the DORF measures are leveled for a student's grade level and thus the fall, beginning of year assessment is leveled for one grade higher than the spring, end of year assessment. Given this, raw score gains are not directly interpretable as gains or losses in latent reading achievement.

¹⁸ Grade level of enrollment at the end of the 2013-14 school year.

in the distribution in both seasons would have a calculated gain of 0.0. Overall on this metric, SummerREADS students appear to have maintained ground over the course of the summer; despite a loss in raw score they on average maintained their relative position in the distribution of scores. The same pattern of relative advantage for SummerREADS over comparison students across grades shown in the raw scores is replicated on this metric. While students in the first grade appear to have gained in the distribution over the summer, second grade students appear to have maintained position and third grade students lost position in the distribution.

Who attended the summer Library Program? How did attenders differ from non-attenders in terms of demographic and academic characteristics?

As previously noted, 345 students were identified as enrolled in K-3rd grade and having attended the Library Program at least once during the summer. Of these students, 192 were positively identified as having been enrolled in one of the six implementing schools at the end of the 2013-14 school year. This number represents approximately 12% of the total enrollment in the six implementing schools in grades K-3 and is likely an underestimate due to the incomplete recording of unique identifiers and grade level for all students in the attendance rosters. To put this in perspective, the number of positively identified Library Program attendees was exactly the same as the number of K-3 grade students in implementing schools who attended City Schools' full day summer program Read to Succeed Academy (see Table 4, n = 192, 12% of total enrollment). As seen in Table 4 attendance at the Library Program was more evenly distributed across implementing schools than Read to Succeed Academy attendance where three of the six schools had no students attending. Finally, 32 students were identified as attending both programs indicating that there was little overlap between the Library Program and Read to Succeed attendance.

Students who were identified as attending the library program (n = 192) were predominately African American (72.4 percent) and eligible for free and reduced priced meals (78.1 percent). Comparing attenders to non-attenders at the six implementing schools it appears that students who attended the summer Library Program were significantly different from non-attenders on a number of demographic characteristics (see

School	LP		RSA		Total Enrollment
	n	%	n	%	
Thomas Johnson Elementary/Middle School	41	20.2	0	0.0	203
Moravia Park Elementary School	45	8.8	158	30.9	511
The Historic Samuel Coleridge-Taylor Elementary School	31	12.0	3	1.2	258
Arlington Elementary/Middle School	13	5.6	31	13.2	234
Southwest Baltimore Charter School	41	21.6	0	0.0	190
Elmer A. Henderson: A Johns Hopkins Partnership School	21	10.2	0	0.0	206
Total	192	12.0	192	12.0	1,602

Note. LP = Library Program. RSA = Read-to-Succeed Academy. Total Enrollment = total enrollment of K-3 grade students at the end of the 2013-14 school year. % = percent of total enrollment.

Table 5). Identified attenders were 20.8 percent white and 57.8 percent female while non-attenders were 10.8 percent white and 49.4 percent female. Seventy-eight percent of attenders were eligible to receive free and reduced priced meals, while 89.7% of non-attenders were FARMs eligible. In addition, only 6.8% of attenders were considered to be chronically absent during the 2013-14 school year as compared to 19.4% of their peers who did not attend the Library Program. Taken together these differences suggest that some underlying aspect of relative disadvantage that is observed through the measured indicators (FARMS status, chronic absenteeism) was likely related to who was attracted to and ultimately attended the Library Program. For example, given the voluntary nature of the program it is not surprising that students who experienced difficulty in attending during the school year would be less likely to take advantage of the Library Program. Next year, the program should consider new modes of outreach to attract the most disadvantaged students including those who have been identified as chronically absent, FARMs eligible and those who lack proficiency in literacy.

Conclusions

Implementation of the SummerREADS/Library Program during the summer of 2014 was estimated to have a significant positive effect on students' summer learning compared to a matched group of students who did not receive 12 leveled, high interest books prior to summer vacation and were not actively given the opportunity to participate in the summer program and Library Program libraries. This stands in contrast to implementation in previous years where no significant effects of SummerREADS only were found on student summer learning loss immediately following implementation; longer term positive effects of the program were

however found on student performance at the end of the school year following the book distribution.

What accounts for the difference in findings across years? The most plausible reason for these differences stem from the way that SummerREADS was implemented in 2014 compared to the previous years, particularly the way that parents were engaged in the program and the marketing and communication surrounding the program. The earlier version of SummerREADS allowed individual schools to create and implement their own parent orientations which were generally not well attended. In 2014 parent orientations were replaced with family nights that were aligned across implementing schools and were much more heavily attended. Therefore more parents in 2014 were exposed to the program directly and received some guidance on how to use the books in meaningful ways with their children than in previous years. While it is impossible to know with certainty, it is likely that greater family engagement in 2014 lead to greater utilization of the SummerREADS books in meaningful ways than occurred in previous years. Moving forward, SummerREADS should continue to strengthen and refine parent engagement as it is likely the key driver of the effectiveness of SummerREADS.

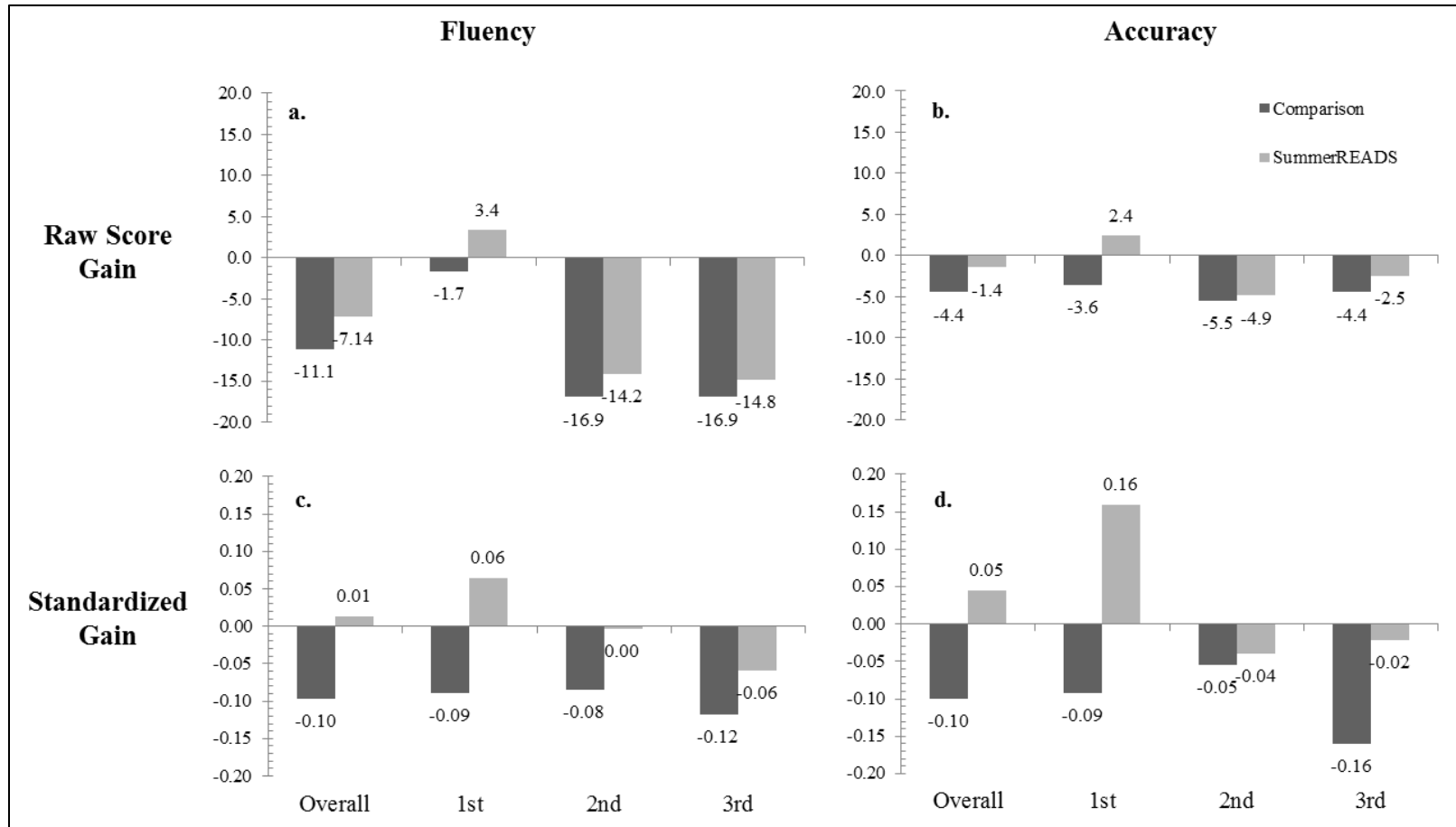
This evaluation cannot speak directly to the effectiveness of opening the Library Project libraries to students during the summer on stemming summer learning loss given the constraints of the available data and design. The demographic comparison of attenders to non-attenders revealed that the program likely attracted a potentially more advantaged group of students (less likely to be FARMS eligible, less likely to be chronically absent) from disadvantaged schools. This “problem” is not unique to this program in that students who are most in need of expanded summer opportunities are often the least likely to take advantage of these opportunities. In part this may be due to the fact that the Library Program was not designed to operate as a daily camp

for students and as such may have not served the needs of some families and students who may have enrolled in formal day camps instead of attending the Library Program. Additionally, despite prominent marketing and communication about the program to families, some families may have still not been aware of the program. To address this future implementation of the Library Program could consider ways of making personal contact with the families of students who are potentially most in need of these types of opportunities but least likely to attend. This would require coordination with faculty, staff and administration at implementing schools to help identify these families.

While this evaluation cannot speak to direct effects of attending the Library Program on student achievement there are likely to have been other indirect effects from the program on student summer learning. Special events at the libraries were advertised and reported on within the wider Baltimore community and within the local school communities. It is possible that the presence of the library program and the visibility of activities that took place in the programs led to more awareness of literacy during the summer among all children and families in the community, whether or not they actually attended the program. This is highly speculative, and future evaluations of the program would need to be specifically designed to be able to determine these indirect effects and be better situated to capture direct effects of the program if they do exist.

Figures

Figure 1: Raw score and standardized summer gain (loss) by measure and grade



Note. Raw score gain was calculated by subtracting the Spring 2014 raw score from the Fall 2014 raw score. Standardized Gain was calculated by subtracting the district-wide mean score from the Fall and Spring raw scores and dividing by the appropriate grade level district level standard deviation and then taking the difference between Spring and Fall. All estimates are unadjusted for student and school characteristics.

Tables

Table 1: Comparison of SummerREADS and Comparison Students' End-of-Year DORF measures in full and matched samples

Grade	Test	Full Sample		Matched		Unmatched	
		Comparison	SummerREADS	Comparison	SummerREADS	Comparison	SummerREADS
2	Fluency	44.3 (29.6)	50.7 (34.4)	49.1 (33.1)	50.2 (32.6)	34.0 (15.9)	51.6 (37.6)
	Accuracy	82.5 (21.4)	82.7 (20.7)	82.5 (23.2)	82.6 (21.0)	82.4 (16.9)	82.8 (20.1)
3	Fluency	73.2 (37.4)	79.7 (38.5)	75.1 (40.1)	75.7 (37.5)	68.5 (29.3)	86.3 (39.5)
	Accuracy	91.1 (14.9)	93.3 (11.7)	90.4 (16.0)	92.2 (13.8)	93.0 (11.8)	95.2 (6.7)
4	Fluency	81.0 (37.7)	77.6 (34.8)	82.3 (40.8)	82.2 (39.6)	78.8 (32.2)	69.5 (21.8)
	Accuracy	93.3 (9.6)	93.8 (7.6)	92.9 (10.5)	93.9 (9.0)	94.0 (8.0)	93.5 (4.1)

Table 2: Comparison of student characteristics in full and matched samples

	Full Sample		Matched Sample		Unmatched Sample	
	Comparison	SummerREADS	Comparison	SummerREADS	Comparison	SummerREADS
Black	0.98	0.75	0.98	0.95	0.96	0.42
White	0.01	0.15	0.00	0.00	0.02	0.40
Latino	0.01	0.05	0.01	0.01	0.01	0.12
Other	0.01	0.04	0.01	0.03	0.01	0.06
Female	0.50	0.49	0.52	0.52	0.47	0.44
FARMS	0.98	0.87	0.98	0.97	0.97	0.7
SPED	0.16	0.12	0.12	0.11	0.23	0.15
Homeless	0.07	0.03	0.06	0.05	0.09	0.00
Chronically Absent	0.33	0.16	0.24	0.13	0.52	0.20
School Year Transfer	0.08	0.03	0.01	0.01	0.22	0.05
<i>n</i>	867	657	574	410	293	247

Note. FARMS = Free and reduced meals. SPED = Special education.

Table 3: Estimates of the effect of SummerREADS on student Beginning of Year DORF measures

Variable	Fluency				Accuracy			
	Unmatched		Matched		Unmatched		Matched	
SR	3.41	***	2.45	*	2.50	***	2.19	**
	(1.20)		(1.37)		(0.84)		(0.99)	
LP	5.33	***	3.83	*	0.24		0.23	
	(1.80)		(2.23)		(1.27)		(1.62)	
RSA	0.09		1.92	*	1.22	*	1.70	**
	(0.97)		(1.12)		(0.69)		(0.81)	
n	1498		979		1498		979	
R²	0.83		0.84		0.74		0.77	
F	338.13		246.00		190.73		156.82	
Prob > F	0.00		0.00		0.00		0.00	

Note. SR = Student received books through SummerREADS. LP = Student attended Library Program at least one day during the summer of 2014. RSA = Student attended City Schools' Read to Succeed Academy at least one day during the summer of 2014. All models include indicators for student racial demographics, gender, free and reduced meals status, special education status, immigrant status, homeless status, chronic absentee status, school year transfer, summer transfer, grade, school match grouping, 2013-14 middle of year fluency and accuracy levels, 2013-14 end of year fluency and accuracy scores and school level percentage of students chronically absent in 2014, school level percent of students scoring proficient and above on 2013 Maryland School Assessment in reading.

* p<.1; ** p<.05; *** p<.01

Table 4: Attendance in Library Program and Read-to-Succeed Academies by school

School	LP		RSA		Total Enrollment
	n	%	n	%	
Thomas Johnson Elementary/Middle School	41	20.2	0	0.0	203
Moravia Park Elementary School	45	8.8	158	30.9	511
The Historic Samuel Coleridge-Taylor Elementary School	31	12.0	3	1.2	258
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Total	192	12.0	192	12.0	1,602

Note. LP = Library Program. RSA = Read-to-Succeed Academy. Total Enrollment = total enrollment of K-3 grade students at the end of the 2013-14 school year. % = percent of total enrollment.

Table 5: Comparison of demographic characteristics of summer Library Program attenders and non-attenders

Student Characteristic	Non-Attender	Attender	
Black	1152 (81.7)	139 (72.4)	***
White	152 (10.8)	40 (20.8)	***
Hispanic	54 (3.8)	3 (1.6)	
Other	52 (3.7)	10 (5.2)	
FARMS	1265 (89.7)	150 (78.1)	***
SPED	201 (14.3)	21 (10.9)	
ELL	81 (5.7)	11 (5.7)	
Female	695 (49.3)	111 (57.8)	**
Chronically Absent	273 (19.4)	13 (6.8)	***
Total	1410	192	