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Title:

Replicating the Effects of a Scaled-up, Teacher-scaffolded Voluntary Summer Reading Program

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Abstract Body

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Background/Context:

The literacy intervention we have been studying is called READS (Reading Enhances Achievement During Summer). It is a teacher-scaffolded voluntary summer reading program with two key features: (a) providing summer books that are matched to students' reading levels and interests and (b) providing teacher scaffolding and parent support for summer reading in the form of teacher lessons and family nights at the end of the school year, as well as materials and messages sent to students and parents in the summer. READS has been implemented in North Carolina schools for the past several years as part of an Investing in Innovation (i3) validation grant that began in fall 2010, and we have results from randomized control trials completed in each of the first three years. This paper will focus on the Year 3 study and compare the Year 3 results to the Year 1 and Year 2 results and the results of earlier studies.

The logic model for READS rests on several pillars of evidence: (1) studies of summer loss in low-income students (e.g., Alexander, Entwisle, & Olson, 2001; Burkam, Ready, Lee, & LoGerfo, 2004; Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996); (2) studies of the relationship between the amount of reading and growth in reading skills, including studies of leisure reading and home-based summer reading (e.g., Anderson, Wilson, & Fielding, 1988; Heyns, 1978; Mol & Bus, 2011); and (3) experimental studies indicating that students make greater progress in reading during the summer if they read books that are well matched to their individual reading levels and interests and additionally receive teacher scaffolding for summer book reading through end-of-year comprehension lessons and parent support of summer reading (Kim, 2006; Kim & White, 2008; White, Kim, Kingston, & Foster, 2014).

Kim and White (2008; see also Kim, 2006) randomly assigned 400 students in grades 3–5 to one of four experimental conditions: control, matched books only, matched books with oral reading scaffolding, and matched books with oral reading and comprehension scaffolding. They found that students in the books with the oral reading and comprehension scaffolding condition made significantly larger comprehension gains on the ITBS reading comprehension test than students in the control group (Cohen's $d = 0.14$), and that there were no other significant effects. Students in the effective treatment condition received three teacher-directed lessons at the end of the school year in which the teacher modeled fluent oral reading and five comprehension strategies (reread, predict, ask questions, make connections, and summarize), and they also received eight books that were matched to their interests and reading levels and mailed to them over the summer.

In the first year of the i3 grant, we conducted a randomized trial of READS in 19 elementary schools in an urban North Carolina school district. As in the Kim and White (2008) study, students in the treatment condition received both summer books matched to their reading levels and interests and teacher scaffolding in the form of end-of-year comprehension lessons. Students in one of the two treatment conditions also received phone calls from a teacher during the summer. Overall, there were no significant treatment effects, and treatment effects did not differ across lesson type. However, there was a significant interaction between the treatment conditions and poverty measured at the school level. The effects of the treatment conditions

were positive for high-poverty schools defined as schools where 75–100% of the students were receiving free or reduced-price lunch (FRL), (Cohen's d = .11 and .08, with and without teacher calls, respectively). For moderate poverty schools (45–74% FRL), the effects of the treatments were negative (Cohen's d = −.11 and −.12, respectively).

The Year 2 study essentially replicated the Year 1 results with a sample of 14 elementary schools in three North Carolina districts. In one treatment group, teachers instructed children to use a comprehension routine with narrative and informational text in end-of-year classroom lessons, parents and family members were invited to a school-based family literacy event, and children were mailed matched books and reading activities during the summer months. In another treatment group, students received the same lessons, books, and family and summer activities, but they also received phone calls to their parents. The effects of the treatment conditions on reading comprehension were moderated by both school and family socioeconomic status (SES). For both the amount of student-reported summer book reading and reading comprehension, the treatment-control contrast was largest for children in low-SES schools and for families and children with fewer books at home.

Purpose/Objective:

The purpose of the Year 3 study was to test the effectiveness of what we called READS-PIF (Reads with Parent Involvement and Follow-up) in a larger sample of school districts and schools. We addressed three main research questions: 1) What was the overall impact of READS-PIF on students' reading comprehension? 2) Was the impact of READS-PIF greater in high poverty schools than in moderate poverty schools? 3) Was the impact of READS-PIF greater for students receiving free or reduced price lunch (FRL)?

Setting:

This study took place in 59 elementary schools from 7 school districts in North Carolina. Of the 59 schools, 44 were high-poverty schools, and 15 were moderate-poverty schools (as defined previously).

Participants:

The final analytic sample included 5284 students (2798 2nd graders, 2486 3rd graders). Nearly 80% of the students in the study were eligible for FRL. On the spring pretest, students scored somewhat below national norms on the ITBS reading comprehension test. The sample mean normal-curve equivalent score was 46.

Intervention/Program:

End-of-year lessons. At the end of the school year, students who were assigned to the intervention group received six lessons during which they learned text-based reading comprehension routines. For narrative texts, the routine was story impressions (McGinley & Denner, 1987), and for informational texts the routine was a parallel routine that we developed, "information impressions." As a pre-reading activity, students read the impression (which is a collection of words and phrases from a book) and made predictions about the book's plot or main

ideas. Teachers then read the text aloud. After reading the book, students evaluated their predictions.

Family nights. Treatment students and their families were invited to a READS Family Night (RFN) at their school. At the RFN, students' families learned about READS, the story impression or information impression activities, the books to be mailed to the students in the summer, and the tri-folds that would be included with each mailed book.

Tri-folds. The tri-folds were an 8.5 x 11 inch paper folded into 3 sections. There was a unique tri-fold for each book. Each trifold included a story or information impression, a place for students to write their predictions, three multiple choice comprehension questions about the book, and questions about whether the student enjoyed the book and whether the student thought the book was well-matched to his or her reading level. Students were instructed to mail each tri-fold back to READS after reading the book.

Follow-up calls. If READS staff did not receive at least one trifold from a student by early July, the student's family received a phone call as a reminder and an inquiry into any potential barriers the student may be encountering. A second and third call was made a few week later to any student who had still not returned a trifold.

Book matching and summer book distribution. Students took a reading interest survey in the spring. Information from this survey, along with information about the students' reading levels from the spring reading comprehension pretest was used to select a set of 8 matched books for each student in the treatment group. Every two weeks throughout the summer, two of the matched books were mailed to treatment group students.

Research Design:

Within each grade and school, students were randomly assigned to the treatment or control condition and pre- and post-tested on a standardized reading comprehension test, the Iowa Tests of Basic Skills (ITBS). In the treatment condition, children participated in end-of-year comprehension lessons and a family literacy event, and they received eight matched books in the summer. Children in the control condition participated in six math lessons, were not invited to a family night, and received no summer books. Within each grade, teachers were randomly assigned to teach either the READS lessons or the math (control) lessons.

Data Collection and Analysis:

Measures. Students' baseline reading achievement of students was measured by the ITBS reading comprehension test in the spring. The ITBS was given again in the fall as a posttest.

Analysis. We used OLS regression to estimate the main effect of the treatment condition, both overall and separately by grade. To address the question of whether school poverty moderated the treatment effect, we included a cross-level interaction involving the student-level treatment effect and school poverty.

Findings/Results:

Table 1 (see Appendix B) presents baseline statistics for treatment and control groups overall and separately by grade level. As shown in the table, the full analytic sample was well-balanced at baseline on demographic variables and measures of reading achievement.

Table 2 presents results of the main analyses of treatment impact on ITBS reading comprehension scores. We found no main effect of assignment to READS in the pooled sample (grades 2 and 3; column 1), and no READS effect for grade 2 or grade 3 (columns 2 and 3). For the pooled sample, we also found no differential treatment effects by student gender, FRL status, or school poverty level (not shown). However, as shown in Table 3, we found that the effect of READS was significantly higher for third grade girls compared to third grade boys, as evidence by the *READS*female* interaction coefficient (standardized effect for boys: -0.04, p=0.23; girls: +0.06, p=0.09).

In this study, we found no evidence that the treatment effect for third graders was greater in high poverty schools than in moderate poverty schools. As shown in Table 3 (Model 3), the READS*Hi-pov interaction was not significant. In addition, poverty measured at the student level did not interact with the treatment (Model 2, Table 3.)

Conclusions:

The results suggest that the scaffolded summer reading program may be effective for third grade girls but not third grade boys. Unlike the Year 1 and Year 2 studies, the results of this study do not indicate that treatment effects are moderated by poverty measured at the school level or individual student level. We are currently analyzing data on girls' and boys' self-reported summer book reading and implementation fidelity that may shed light on the differential treatment effects by gender for third graders, the failure to replicate our Year 1 and Year 2 findings on the moderation of treatment effects, or both. We are also analyzing district differences and other variables measured at the school level.

Appendices

Appendix A. References

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Appendix B. Tables and Figures

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Table 1.
Randomization of Treatment and Control Using Full and Analytic Sample, for Both Grades and Separately by Grade Level

	Full Sample				Analysis Sample			
	Both Grades							
	Cont	Treat	*p*-value	*n*	Cont	Treat	*p*-value	*n*
% Female	51.75	50.60	0.32	6370	52.91	51.10	0.16	5284
% FRL	77.59	77.30	0.63	6322	77.11	76.41	0.29	5284
% LEP	16.62	16.36	0.67	6301	17.20	16.65	0.41	5281
% Hispanic	21.30	21.35	0.96	6284	21.88	21.76	0.89	5279
% Black	39.86	39.29	0.52	6284	38.31	37.80	0.60	5279
% White	22.76	23.04	0.72	6284	23.39	23.78	0.66	5279
% Other Race	16.08	16.32	0.69	6284	16.41	16.66	0.73	5279
< 21 Children's Books	41.66	43.27	0.13	6114	41.76	44.01	0.06	5155
< 31 Children's Books	54.87	56.03	0.30	6114	55.17	56.72	0.21	5155
Reading on Grade Level	36.85	35.96	0.42	5881	37.97	37.01	0.44	4889
25th-50th Percentile Reading	24.65	24.80	0.88	5881	23.86	24.41	0.60	4889
51st-75th Percentile Reading	32.74	32.45	0.80	5881	33.37	33.76	0.77	4889
Spr. Comp Std. Score	174.4	174.7	0.52	6080	175.2	175.2	0.93	5284
Spr. Comp NCE	46.20	46.42	0.63	6080	46.96	46.87	0.87	5284
	Grade 2							
% Female	50.36	50.28	0.96	3428	51.61	51.24	0.83	2798
% FRL	78.03	76.66	0.09	3400	77.38	75.56	0.04	2798
% LEP	17.61	16.12	0.08	3391	18.15	16.15	0.03	2797
% Hispanic	22.67	22.89	0.83	3380	23.23	23.35	0.93	2795
% Black	39.39	38.95	0.70	3380	37.81	37.39	0.75	2795
% White	22.08	23.13	0.31	3380	22.94	23.73	0.50	2795
% Other Race	15.86	15.02	0.26	3380	16.02	15.53	0.58	2795
< 21 Children's Books	44.94	46.25	0.38	3290	45.77	46.69	0.58	2728
< 31 Children's Books	57.58	58.60	0.50	3290	58.40	58.61	0.90	2728
Reading on Grade Level	35.74	37.02	0.37	3137	37.23	38.06	0.59	2569
25th-50th Percentile Reading	23.72	23.58	0.91	3137	22.73	22.66	0.96	2569
51st-75th Percentile Reading	30.87	30.97	0.94	3137	31.43	32.34	0.58	2569
Spr. Comp Std. Score	167.5	167.5	0.99	3250	168.4	167.9	0.52	2798
Spr. Comp NCE	46.65	46.64	0.99	3250	47.59	47.06	0.46	2798
	Grade 3							
% Female	53.38	50.97	0.15	2942	54.39	50.96	0.06	2486
% FRL	77.06	78.04	0.26	2922	76.79	77.34	0.58	2486
% LEP	15.45	16.64	0.17	2910	16.12	17.20	0.27	2484

% Hispanic	19.71	19.54	0.88	2904	20.36	19.98	0.75	2484
% Black	40.41	39.69	0.60	2904	38.88	38.26	0.67	2484
% White	23.56	22.93	0.61	2904	23.90	23.84	0.96	2484
% Other Race	16.32	17.84	0.15	2904	16.85	17.92	0.36	2484
< 21 Children's Books	37.82	39.79	0.20	2824	37.23	41.00	0.03	2427
< 31 Children's Books	51.70	53.03	0.42	2824	51.52	54.58	0.09	2427
Reading on Grade Level	38.14	34.74	0.05	2744	38.81	35.88	0.14	2320
25th-50th Percentile Reading	25.71	26.19	0.74	2744	25.11	26.34	0.45	2320
51st-75th Percentile Reading	34.88	34.14	0.68	2744	35.54	35.33	0.92	2320
Spr. Comp Std. Score	182.2	182.9	0.37	2830	182.9	183.4	0.49	2486
Spr. Comp NCE	45.69	46.17	0.45	2830	46.24	46.65	0.57	2486

Notes: The analysis sample is based on students with non-missing data for pre- and posttest, FRL, gender, and high poverty school status. Statistics are derived from regression of variable on indicator for treatment assignment and fixed effects for randomization block; *p*-values test the null hypothesis of no difference between treatment and control groups and adjust for clustering of students within classroom. *Spr Comp Score* is students' standard score on the ITBS reading comprehension subtest. *Spr Comp NCE* is students' normal curve equivalent score on the ITBS reading comprehension subtest. FRL=student is eligible for free or reduced-price lunch. LEP=student is classified as limited English proficiency. *< 21 Children's Books* = % students reporting owning <21 children's books; *Reading on Grade Level=%* of students rated by teacher as reading on grade level; 25th-50th Percentile Reading=% of students rated by teacher as being between the 25th-50th percentile of readers.

Table 2.
READS Main Effects on Reading Comprehension for Full Sample and by Grade Level

	(1) Full Sample b/se	(2) Grade 2 b/se	(3) Grade 3 b/se
READS	0.008	0.008	0.007
	(0.017)	(0.024)	(0.024)
Pretest	0.784***	0.777***	0.793***
	(0.009)	(0.013)	(0.014)
_cons	-0.017	-0.023	-0.010
	(0.012)	(0.016)	(0.017)
N	5284	2798	2486
r2	0.702	0.690	0.715
df_m	2	2	2
df_r	4394	2329	2063
F	3442.271	1726.178	1722.438

Note: All models control for fixed effects of randomization blocks

Table 3.
READS Treatment Effect Interactions with Student Gender, FRL Status, and High Poverty School (Grade 3 Only)

	(1) Reading Comp b/se	(2) Reading Comp b/se	(3) Reading Comp b/se
READS	-0.044	0.022	-0.022
	(0.036)	(0.053)	(0.042)
Female	0.034		
	(0.037)		
READS*female	0.102*		
	(0.052)		
Pretest	0.787***	0.779***	0.793***
	(0.014)	(0.014)	(0.014)
FRL		-0.229***	
		(0.057)	
READS*FRL		-0.017	
		(0.060)	
READS*Hi-Pov			0.043
			(0.051)
_cons	-0.028	0.167***	-0.010
	(0.026)	(0.047)	(0.017)
N	2486	2486	2486
r2	0.717	0.718	0.715
df_m	4	4	3
df_r	2061	2061	2062
F	870.538	875.747	1148.368

Note: All models control for fixed effects of randomization blocks