Abstract Title Page
Not included in page count.

Title: Evaluating Intervention Effects of Scholastic READ 180 on Low-Achieving Incarcerated Youth

Author(s):

Jing Zhu, Ph.D., The Ohio State University
William E. Loadman, Ph.D., The Ohio State University
Richard G. Lomax, Ph.D., The Ohio State University
Raeal Moore, Ph.D., The Ohio State University

Abstract Body.

Background/context:

Reading proficiency is considered a top priority in education (Alliance for Excellent Education (AEE), 2002). Great emphasis has been placed upon improving early literacy, as research supports the critical role of reading skills during early grades in student long-term literacy acquisition and academic success (Cunningham & Stanovich, 1997; No Child Left Behind Act, 2001). Various early literacy interventions are found to be effective, with a higher percentage of elementary school students capable of reading proficiently today than in the past (What Works Clearinghouse [WWC], 2007). Such improvement however does not carry over to reading achievement in secondary schools. Recent data from the National Assessment of Educational Progress (NAEP) indicate that approximately 70 percent of the nation's eighth graders read below the proficient level and 27 percent read below the basic level (Lee, Grigg, & Donahue, 2007). Six million adolescents are reading well below grade level (AEE, 2002, 2003a). Deficiencies exhibited by the older struggling reader are lack of decoding skills and reading fluency, poor comprehension due to the inability to form mental models, lack of vocabulary and limited background knowledge, inability to process and understand grade-level content area text with a high concentration of academic language, and low motivation and lack of connection to materials and school (Papalewis, 2005). Related essential skill areas, as identified by the National Reading Panel, include phonemic awareness, phonics, fluency, vocabulary, and comprehension (Kamil, 2003).

The prevalent low literacy of adolescents has far-reaching ramifications for society. Poor readers are at greater risk of dropping out of school since they do not possess the necessary literacy skills to catch up with the curriculum (Papalewis, 2005; Snow & Biancarosa, 2003). Over 3,000 students drop out of high school every day, and students reading below grade level are twice as likely to drop out of school as those who are able to read on or above grade level (AEE, 2003b; Fleishman, 2004). A more disturbing fact is that adolescents who drop out of school are three and a half times more likely than high school graduates to commit offenses (Coalition for Juvenile Justice (CJJ), 2001). It is known that a very high percentage of incarcerated youth have been unsuccessful in school and that the great majority have a significant reading deficit.

Literacy is an important prerequisite for intervening in the cycle of delinquent behavior. Research suggests that quality reading programs may help reduce the recidivism rate of incarcerated youth by over 20 percent even when the national recidivism rate for juvenile delinquents is as high as 60 to 84 percent (CJJ, 2001; National Center for Educational Statistics, 1999; Steurer, Smith & Tracy, 2001).

Purpose / objective / research question / focus of study:

Among various interventions targeting adolescent students who read significantly below grade level, the Scholastic READ 180 is an intensive daily program that makes use of technology and combines research-based reading practices (Scholastic, 2004, 2005, 2006). Since the launch of READ 180, Scholastic Inc. and many schools that have deployed the program have been jointly conducting impact analyses. Although many studies maintain that students receiving READ 180 display remarkable growth on reading achievement, the majority of these studies are inadequate to provide strong evidence for causal conclusions of the intervention effectiveness of

READ 180 according to the WWC Evidence Standards (2006). In addition, there is no literature found regarding the impact of READ 180 on the population of incarcerated youth.

As a result, based on a randomized clinical field trial, the major purpose of this longitudinal study was to investigate if READ 180 had a meaningful impact on the reading proficiency of low-achieving incarcerated youth over time, when comparing the experimental group with a comparison group being instructed with a traditional educational reading program on reading achievement and growth.

Setting:

Since October 2006, the Ohio Department of Youth Services (ODYS) has been implementing the Scholastic's READ 180 program in the ODYS high schools. The project was funded by the Institute of Education Sciences (IES) Striving Readers program that aims to improve the reading skills of secondary school students who are reading below grade level (US DOE, 2006). The ODYS operates as a public school educational district which is comprised of one intake facility and seven high schools, each located at one of the juvenile correctional facilities dispersed throughout the state of Ohio. Among the seven schools, six house boys and one keeps girls. These institutions operate year-round and offer four 10-week terms of schooling in each academic year. Each term has approximately 45 instructional days and across the four terms delivers approximately 180 days of instruction annually. The ODYS academic year begins in July and ends in June.

Note that the program is currently starting its fourth year, and by the time of the 2010 SREE conference, the data from the third year of implementation will have been received and analyzed. This proposal only contains two years of results, but this proposed presentation will include data and results from the first three years of program implementation and subsequent analyses.

Population / Participants / Subjects:

In this study, students targeted by the READ 180 intervention were youth who were assigned to the care of the ODYS. These youth were eligible for READ 180 instruction if they were: 1) assigned to the care of ODYS for more than six months; 2) determined to be below proficient, but above "below basic" in reading level as assessed by baseline tests; and, 3) a non-high school graduate. Eligible youth were then split randomly between the treatment and comparison groups.

A total of 1,149 eligible youth were serviced by ODYS from October 2006 to November 2008. While 609 (53%) were randomly assigned to READ 180, the remaining 540 (47%) were randomly assigned to the traditional English classroom. Since Scholastic makes the argument that only youth with two or more quarters exposure to READ 180 should be included in any impact analyses, youth who were not supposed to have any READ 180 treatment (they were in school for less than five weeks at any time during the first two years of the project) or who were supposed to have only one quarter of treatment, were omitted from the Intent to Treat (ITT) analyses (Ellenberg, 1994). A final ITT sample of 710 youth were included in this study as they were expected to receive at least two quarters of treatment and had scores on all independent measures utilized in the hierarchical models. A test for equivalency was conducted between those randomly assigned to treatment conditions and those included in the ITT analyses. The groups were statically similar on key demographic variables and SRI as well as other test variables measured at baseline. In addition, similar baseline equivalence tests were also

conducted for the READ 180 and comparison subjects in the final study sample. The results suggested that the two groups were equivalent on the observed demographics as well as the baseline scores. Thus the randomization process worked well in the study.

Table B.1 summarizes the demographic information for the final ITT sample analyzed in this study (please insert Table B.1 here). It was observed that the absolute majority of these incarcerated youth were male and there was a high proportion of students having various disabilities. Information regarding race/ethnicity shows that there was a high percentage of Black and a considerable proportion of White youth, but very low percentages for other racial/ethnic groups. The age ranged from 14 to 22, with most youth around 16 to 20 years old. As for the current grade levels, the majority of students were placed in grades 9 and 10.

Intervention / Program / Practice:

Published by Scholastic Inc. in 1999, READ 180, a daily 90-minute structured reading program, is composed of five components – whole group, individualized learning, computer activities, small group, and wrap up (Scholastic, 2006). The first and last segments, 20 and 10 minutes respectively, include the teacher and students together. The remaining three components provide 20 minute rotations of students in small groups. It was a challenge for teachers in each retention facility to execute the entire 90 minutes. In contrast, youth in the typical 45-minute unstructured traditional English classes do individual work that is previously assigned and kept in individual folders, with the teacher giving help as needed.

Research Design:

This longitudinal study was based on a randomized clinical field trial. Incarcerated youth meeting the eligibility criteria for READ 180 were randomly assigned to either the READ 180 group (experimental) or a traditional reading program (comparison) using a computer-based random number generator specified by the evaluator.

Data Collection and Analysis:

The Scholastic Reading Inventory (SRI), a computer-adaptive assessment that measures student reading levels, serves as the outcome measure for the present study. For each participant, the SRI was taken at baseline, and then repeatedly measured at the end of each term. The California Achievement Test (CAT) assessments of reading and math were also administered to the subjects at the baseline, and they serve as two major covariates. The treatment group (1 = READ 180, 0 = Comparison) to which an eligible youth was assigned was recorded as the primary predictor of interest in the study. The demographic information listed in Table B.1 was also collected during the intake process. We statistically controlled for the influences of salient subject covariates such as age, race/ethnicity, disability status, grade level, and baseline Reading CAT and Math CAT scores during analysis.

In addition, the institution at which each youth was placed was also recorded. As aforementioned, the schools were confounded with gender with 6 boys schools and 1 girls school, and also there were very few female youth available for the study. Therefore the gender variable was not appropriate to be included in the analysis. Instead, the institution variable was used to assess if there was any influence from the schools. Moreover, it was noted that some youth moved once or twice during the school year. Thus a school mobility variable was created based on if there was any movement between the schools (1= with mobility, 0= without mobility). The variable is dichotomized since there were few students with 2 or more moves.

Hierarchical linear modeling (HLM) was employed for the outcome analysis. HLM has become an accepted statistical approach in educational research because it not only adjusts for the clustering effect but also allows statistical controlling of multiple covariates within the same analysis (Raudenbush & Bryk, 2002; Singer & Willett, 2003; Snijders & Bosker, 1999). These models also take into account the multiple dimensions of data structure: one is that students are nested within classes and schools, and the other is that the same students are typically measured repeatedly over time (Plewis, 2000). Both cross-sectional and longitudinal HLM analyses were conducted using the conservative ITT sample. The outcome variable for the cross-sectional analysis was the SRI score after two quarters of treatment, whereas that for longitudinal analysis was the repeated measures of SRI over nine potential points in time.

The fact that a substantial proportion of students moved at least once during their stay (26.98%) caused great concern in using institution as the highest level in HLM. Nonetheless, to account for potential clustering effects, we used the institution to which a given youth was first assigned in the HLM analysis. While a three-level longitudinal model would not converge, the two-level cross-sectional full model showed that the between-schools variance component was non-significant (p=.200, see Table B.6). Thus we were not overly concerned about the clustering effect in this case and instead used institutions as a categorical variable at the student-level model in our longitudinal analysis.

The full HLM model used in the cross-sectional analysis is:

Level-1 (student level model):

$$\begin{aligned}\mathrm{SRI2}_{ij} &= \alpha_{0j} + \alpha_{1j}(\mathrm{SRI0}_{ij} - \overline{\mathrm{SRI0.}}) + \alpha_{2j}(\mathrm{WHITE}_i) + \alpha_{3j}(\mathrm{AGE}_i - \overline{\mathrm{AGE.}}) \\ &\quad + \alpha_{4j}(\mathrm{MATHCAT}_i - \overline{\mathrm{MATHCAT.}}) + \alpha_{5j}(\mathrm{READCAT}_i - \overline{\mathrm{READCAT.}}) + \alpha_{6j}(\mathrm{DISB}_i) \\ &\quad + \alpha_{7j}(\mathrm{GRDLVL}_i - \overline{\mathrm{GRDLVL.}}) + \alpha_{8j}(\mathrm{MOBL}_i) + \alpha_{9j}(\mathrm{TRTGRP}_i) + \varepsilon_{ij}\end{aligned}$$

Level 2 (school level model):

$$\begin{aligned}\alpha_{0j} &= \alpha_0 + u_j \\ \alpha_{1j} &= \alpha_1 \\ &\vdots \\ \alpha_{9j} &= \alpha_9\end{aligned}$$

The full longitudinal linear model is:

Level-1 (within-person model):

$$SRI_{ij} = \alpha_i + j\beta_i + \varepsilon_{ij}\text{, for } i = 1,2,...,n \text{ and } j = 0,1,2,...N_i$$

Level 2 (student level model):

$$\begin{aligned}\alpha_i &= \alpha_0 + \alpha_1(\mathrm{WHITE}_i) + \alpha_2(\mathrm{AGE}_i - \overline{\mathrm{AGE.}}) + \alpha_3(\mathrm{MATHCAT}_i - \overline{\mathrm{MATHCAT.}}) \\ &\quad + \alpha_4(\mathrm{READCAT}_i - \overline{\mathrm{READCAT.}}) + \alpha_5(\mathrm{DISB}_i) + \alpha_6(\mathrm{GRDLVL}_i - \overline{\mathrm{GRDLVL.}}) \\ &\quad + \alpha_7(\mathrm{INST}_i) + \alpha_8(\mathrm{MOBL}_i) + \alpha_9(\mathrm{TRTGRP}_i) + b_{0i} \\ \beta_i &= \beta_0 + \beta_1(\mathrm{WHITE}_i) + \beta_2(\mathrm{AGE}_i - \overline{\mathrm{AGE.}}) + \beta_3(\mathrm{MATHCAT}_i - \overline{\mathrm{MATHCAT.}}) \\ &\quad + \beta_4(\mathrm{READCAT}_{ii} - \overline{\mathrm{READCAT.}}) + \beta_5(\mathrm{DISB}_i) + \beta_6(\mathrm{GRDLVL}_i - \overline{\mathrm{GRDLVL.}}) \\ &\quad + \beta_7(\mathrm{INST}_i) + \beta_8(\mathrm{MOBL}_i) + \beta_9(\mathrm{TRTGRP}_i) + b_{1i}\end{aligned}$$

Both full HLM models were further reduced by removing nonsignificant predictors. Please refer to the appended tables for the list of variables retained in the final models and the associated results.

Findings / Results:

The results for full and final HLM models are presented in Appendix B (please insert Tables B.2-B.13 here). Note that even though the longitudinal analysis was more consistent with the research design applied in this study, the cross-sectional analysis at the end of the second term was also conducted to check the consistency of findings for the ITT sample. Also note that we tried adding a quadratic growth term in the longitudinal analysis but the model fit was not as good as the linear model, so the latter was used for final interpretation.

Tables B.8-B.10 present the results of the final longitudinal linear model. It was found that READ 180 had a significantly positive impact on the reading proficiency of low-performing incarcerated youth, with a constant growth rate over time. Specifically, compared to subjects in the comparison group, the students in READ 180 on average gained 16.01 more SRI points after each term, while controlling for other covariates. The results based on the cross-sectional final model were generally consistent (see Tables B.11-B.13). Compared to subjects in the traditional English program, the READ 180 students on average gained 45.87 more SRI points after two quarters of treatment, with other factors being controlled. So far there has been no consensus on how effect sizes should be exactly calculated in HLM. In this case Cohen's f^2 (Cohen, 1988; Verbeke & Molenberghs, 2000; Littell, Milliken, Stroup, Wolfinger, & Schabenberger, 2006) were calculated as the measure for effect size. In addition, Glass's Δ was also calculated for the cross-sectional model due to its popularity in practice (NAEP, 2006). It was found that the effect sizes for the READ 180 treatment were generally small, which might be due to the large standard deviations of the SRI variable.

In addition, both cross-sectional and longitudinal analyses indicated that baseline test scores were statistically significant (i.e., Read CAT, Math CAT, and Baseline SRI in the cross-sectional model) and mostly accounted for a substantial portion of variance in the reading outcome of the youth (see Tables B.8 & B.11). A few demographic variables (i.e., age, disability, and mobility) were also found to be significant in the longitudinal final model, accounting for variability in the initial reading status and/or the reading growth rate of the low-achieving incarcerated youth (see Table B.8).

Conclusions:

This study demonstrated that the READ 180 program had a positive impact on the low-performing incarcerated youth in the state of Ohio, even though the analysis was based on the ITT sample of youth who did not receive the entire amount of intended READ 180 treatment. The experimental group, on average, improved their reading performance from baseline to post-test assessment at a higher rate relative to those comparison subjects randomly assigned to the traditional English curriculum. READ 180 students outperformed, on average, youth in the traditional English classes with a gain of approximately 70-80 SRI points in one academic year. Gains in reading performance were consistent across different analyses. While significant reading progress was achieved, the typical youth in READ 180 classes was still not reading at grade level. The fact that the entire 90 minutes of instructional time was not met during the first two years of the READ 180 program implementation may be a possible explanation. As the treatment program continues to mature, it will be interesting to see if these struggling readers eventually achieve grade level status in their reading.

Appendices.

Appendix A. References

Alliance for Excellent Education. (2002). *Every child a graduate*. Washington, DC: Author.

Alliance for Excellent Education (2003a). *NCLB and Middle Schools: Confronting the Challenge*. Policy Brief, July 2003. Washington, DC: Author.

Alliance for Excellent Education. (2003b). *Left out and left behind: NCLB and the American high school*. Washington, DC: Author.

Coalition for Juvenile Justice (2001). *Abandoned in the Back Row: New Lessons in Education and Delinquency Prevention*. (Coalition for Juvenile Justice 2001, Annual Report). Retrieved May 01, 2008 from http://www.juvjustice.org/media/resources/resource_122.pdf

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. (3rd Edition). Hillsdale, NJ: L. Erlbaum Associates.

Cunningham, A. E., & Stanovich, K. E. (1997). Early reading acquisition and its relationship to reading experience and ability 10 years later. *Developmental Psychology, 33,* 934–945.

Ellenberg, J.H. (1996). Intent-to-Treat Analysis versus As-Treated Analysis. *Drug Information Journal, 30,* 535-544.

Fleishman, E. B. (2004). *Adolescent Literacy: A National Reading Crisis*. Scholastic professional paper, New York, NY: Scholastic, Inc.

Kamil, M. L. (2003). *Adolescents and literacy: Reading for the 21st century*. Washington, DC: Alliance for Excellent Education.

Lee, J., Grigg, W., & Donahue, P. (2007). *The Nation's Report Card: Reading 2007* (NCES 2007-496). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education, Washington, D.C.

Littell, R. C., Milliken, G. A., Stroup, W. W., Wolfinger, R. D., & Schabenberger, O. (2006). *SAS System for Mixed Models* (2nd edition). SAS Institute Inc.

National Assessment of Educational Progress. (2006). *Comparing private schools and public schools using hierarchical linear modeling* (NCES 2006-461). Washington, DC: U.S. Department of Education.

National Center for Education Statistics. (1999). *1992 national adult literacy survey* (NCES 2001457). Washington, DC: U.S. Department of Education. Retrieved March 31, 2008 from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=199909

No Child Left Behind Act of 2001, Pub. L. No. 107–110, 115 Stat 1425 (2002).

Papalewis, R. (2005). *Struggling Middle School Readers: Successful, Accelerating Intervention.* Scholastic professional paper, New York, NY: Scholastic, Inc.

Plewis, I. (2000). Evaluating educational interventions using multilevel growth curves: The case of Reading Recovery. *Educational Research and Evaluation, 6,* 83-101.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA: Sage publications, Inc.

Scholastic, Inc. (2004). *A Study of READ 180 at Shiprock High School in Central Consolidated School District on the Navajo Indian Reservation, New Mexico*. Final report prepared by Scholastic Research and Evaluation Department, New York, NY.

Scholastic, Inc. (2005). *READ 180: America's premier reading intervention program for elementary through high school.* New York, NY: Scholastic, Inc.

Scholastic, Inc. (2006). *Scholastic's READ 180: A Heritage of Research*. New York, NY.

Singer, J. D. & Willett, J. B. (2003). *Applied longitudinal data analysis*: Modeling change and event occurrence. NY: Oxford.

Snijders, T., & Bosker, R. (1999). *Multilevel analysis*. Thousand Oaks, CA: Sage Publications.

Snow C. E., & Biancarosa, G. (2003). *Adolescent literacy and the achievement gap: What do we know and where do we go from here*? New York: Carnegie Corporation of New York.

Steurer, S., Smith, L., & Tracy, A. (2001). *Three State Recidivism Study*. Correctional Education Association & The U.S Department of Education Office of Correctional Education, Lanham, MD.

U.S. Department of Education. (2006). Striving Readers program home website. Washington, DC. Retrieved May 6, 2009 from http://www.ed.gov/programs/strivingreaders/index.html

Verbeke, G. & Molenberghs, G. (2000). *Linear mixed models for longitudinal data*. New York: Springer.

What Works Clearinghouse. (2006). *WWC Evidence Standards for Reviewing Studies*. Washington, DC: U.S. Department of Education, Institute of Education Sciences. Retrieved October 16, 2006 from http://ies.ed.gov/ncee/wwc/pdf/study_standards_final.pdf

Appendix B. Tables and Figures
Not included in page count.

Table B.1: Demographics for the Final Sample of 710 Low-Achieving Incarcerated Youth

Variable	Description	Comparison		READ 180	
		Freq	%	Freq	%
Race	Asian/Pacific Islander	0	0.00%	0	0.00%
	Black	225	69.23%	270	70.13%
	Hispanic	6	1.85%	12	3.12%
	Native American/Alaskan	0	0.00%	0	0.00%
	White	81	24.92%	88	22.86%
	Multiracial	13	4.00%	15	3.90%
	Total Non-White	244	75.08%	297	77.14%
	Total White	81	24.92%	88	22.86%
Gender	Male	314	96.62%	372	96.62%
	Female	11	3.38%	13	3.38%
Age	14	1	0.31%	2	0.52%
	15	14	4.31%	11	2.86%
	16	45	13.85%	51	13.25%
	17	77	23.69%	78	20.26%
	18	91	28.00%	91	23.64%
	19	66	20.31%	96	24.94%
	20	29	8.92%	44	11.43%
	21	2	0.62%	10	2.60%
	22	0	0.00%	2	0.52%
Grade Level	8	2	0.62%	3	0.78%
	9	137	42.15%	147	38.18%
	10	93	28.62%	120	31.17%
	11	18	5.54%	40	10.39%
	12	17	5.23%	12	3.12%
	13	58	17.85%	63	16.36%

Table B.1 continued

Variable	Description	Comparison		READ 180	
		Freq	%	Freq	%
Disability Status[Δ]	Autism	1	0.31%	1	0.26%
	Cognitive Disability-Mental Retardation	27	8.31%	30	7.79%
	Deafness	0	0.00%	0	0.00%
	Emotional Disturbance	66	20.31%	89	23.12%
	Mental Retardation	0	0.00%	2	0.52%
	Not Applicable	179	55.08%	192	49.87%
	Other Impairment-Minor	9	2.77%	10	2.60%
	Other Impairment-Major	0	0.00%	1	0.26%
	Orthopedic Impairment	0	0.00%	0	0.00%
	Speech or Learning Disability	0	0.00%	2	0.52%
	Specific Learning Disability	43	13.23%	56	14.55%
	Traumatic Brain Injury	0	0.00%	1	0.26%
	Visual Impairment	0	0.00%	1	0.26%
	Total Nondisabled	179	55.08%	192	49.87%
	Total Disabled	146	44.92%	193	50.13%
Special Education	No	191	58.77%	213	55.33%
	Yes	134	41.23%	172	44.68%

[Δ]: Disability status was heavily confounded with special education status as only a few disabled students did not receive special education services.

Table B.2: Estimates for the Fixed Effects in the Full Longitudinal Linear Model

Fixed Effect		Estimate	SE	*t*-ratio	*p*-value	Cohen's f^2
Intercept	α_0	833.97	36.7445	22.7	<.0001	--
White	α_1	-18.468	17.0593	-1.08	0.2794	0.00
Age	α_2	16.3356	5.6547	2.89	0.004	0.01
MathCAT	α_3	10.6273	3.6583	2.91	0.0038	0.01
ReadCAT	α_4	37.3307	3.4882	10.7	<.0001	0.15
Disbility	α_5	-38.2854	14.7351	-2.6	0.0096	0.01
GradeLevel	α_6	9.0742	5.6789	1.6	0.1105	0.00
Inst_1		-13.4189	38.7226	-0.35	0.729	
Inst_2		-24.1632	38.3639	-0.63	0.529	
Inst_3		-29.1794	45.2405	-0.64	0.5191	
Inst_4	α_7	-39.9966	39.8672	-1	0.3161	0.00
Inst_5		-22.8315	41.8718	-0.55	0.5857	
Inst_6		-34.9145	64.0001	-0.55	0.5855	
Inst_7		-17.8564	38.5793	-0.46	0.6436	
Mobility	α_8	-1.151	13.5234	-0.09	0.9322	0.00
TRTGroup	α_9	-10.1323	13.0773	-0.77	0.4387	0.00
Time	β_0	3.1044	14.4287	0.22	0.8297	0.01
White*Time	β_1	-1.6608	6.345	-0.26	0.7936	0.00
Age*Time	β_2	-3.9793	2.123	-1.87	0.0615	0.01
MathCAT*Time	β_3	-0.3611	1.3652	-0.26	0.7915	0.00
ReadCAT*Time	β_4	3.8526	1.3107	2.94	0.0034	0.02
Disbility*Time	β_5	9.0201	5.3774	1.68	0.0941	0.01
GradeLevel*Time	β_6	-0.1094	2.132	-0.05	0.9591	0.00
Inst_1*Time[Δ]		-39.6917	15.0873	-2.63	0.0087	
Inst_2*Time		-18.6763	14.9668	-1.25	0.2126	
Inst_3*Time		-3.8956	17.6633	-0.22	0.8255	
Inst_4*Time	β_7	-8.7474	15.7215	-0.56	0.5781	0.06
Inst_5*Time		2.3468	15.822	0.15	0.8821	
Inst_6*Time		-25.981	24.7166	-1.05	0.2936	
Inst_7*Time		-10.3185	15.0613	-0.69	0.4935	
Mobility*Time	β_8	13.254	4.8902	2.71	0.007	0.02
TRTGroup*Time	β_9	22.0153	4.7881	4.6	<.0001	0.05

[Δ]: Given that 25% of the youth identified as being housed in Facility 1 actually moved out of that facility during the first two years of the project, using "facility" as an accurate measure of students nested in school is problematic. Further, there was a significant incident in facility one that resulted in the teacher being absent from the classroom for more than two months due to having her jaw broken by one of the youths in the class by being hit in the face with a flower pot. The class aide assumed responsibility for the class during her absence and the position of the aide was filed by temporary personnel. We think this explains the differential performance in school 1 from the performances across the other institutions. We therefore omitted the institution variable in the final, reduced model (see Table B.8) and decided to adopt and interpret a more parsimonious model.

Table B.3: Estimated Covariance Matrix for the Random Effects in the Full Longitudinal Linear Model

Random Effect	b_0	b_1
b_0	17301*	
b_1	-56.7029	1651.80*
ε	21059*	

Note. * p-value < .05

Table B.4: Fit Indices for the Full Longitudinal Linear Model

	-2 (log-likelihood)	AIC	BIC
Full Linear Model	48075.0	48147.0	48311.3

Table B.5: Estimates for the Fixed Effects in the Full Cross-Sectional Model

Fixed Effect		Estimate	SE	t-ratio	p-value	Cohen's f^2	Glass's Δ
Intercept	α_0	763.49	19.0818	40.01	<.0001	--	2.66
Baseline SRI	α_1	0.5494	0.05398	10.18	<.0001	0.15	0.00
White	α_2	-4.9206	21.3061	-0.23	0.8174	0.00	-0.02
Age	α_3	-7.6035	7.0948	-1.07	0.2843	0.00	-0.03
MathCAT	α_4	8.6433	4.6865	1.84	0.0656	0.00	0.03
ReadCAT	α_5	30.6152	4.7863	6.40	<.0001	0.06	0.11
Disbility	α_6	18.9096	18.9354	1.00	0.3183	0.00	0.07
GradeLevel	α_7	1.8311	7.2241	0.25	0.8	0.00	0.01
Mobility	α_8	25.0942	17.3155	1.45	0.1477	0.00	0.09
TRTGroup	α_9	48.1012	16.7544	2.87	0.0042	0.01	0.17

Table B.6: Estimated Random Effects in the Full Cross-Sectional Model

Variance Component	Estimate	SE	z-value	p-value
σ^2	48102	2570.34	18.71	<.0001
τ_{00}	469.88	557.83	0.84	0.1998

Table B.7: Fit Indices for the Full Cross-Sectional Model

	-2 (log-likelihood)	AIC	BIC
Full Model	9646.8	9670.8	9671.8

Table B.8: Estimates for the Fixed Effects in the Final Longitudinal Linear Model

Fixed Effect		Estimate	SE	*t*-ratio	*p*-value	Cohen's f^2
Intercept	α_0	792.40	8.8813	89.22	<.0001	--
Age	α_1	22.0061	4.6684	4.71	<.0001	0.03
MathCAT	α_2	11.5954	3.2766	3.54	0.0004	0.02
ReadCAT	α_3	37.5806	3.2396	11.6	<.0001	0.17
Disbility	α_4	-28.9203	13.2028	-2.19	0.0288	0.01
Age*Time	β_1	-6.5967	1.803	-3.66	0.0003	0.03
ReadCAT*Time	β_2	3.3487	1.0137	3.3	0.001	0.02
Mobility*Time	β_3	8.3732	4.1509	2.02	0.0443	0.01
TRTGroup*Time	β_4	16.0102	3.4722	4.61	<.0001	0.05

Table B.9: Estimated Covariance Matrix for the Random Effects in the Final Longitudinal Linear Model

Random Effect	b_0	b_1
b_0	17703*	
b_1	-171.76	1968.41*
ε	21024*	

Note. * *p*-value < .05

Table B.10: Fit Indices for the Final Longitudinal Linear Model

	-2 (log-likelihood)	AIC	BIC
Final Linear Model	48092.2	48100.2	48118.4

Table B.11: Estimates for the Fixed Effects in the Final Cross-Sectional Model

Fixed Effect		Estimate	SE	*t*-ratio	*p*-value	Cohen's f^2	Glass's Δ
Intercept	α_0	782.83	16.0105	48.9	<.0001	--	2.73
Baseline SRI	α_1	0.5366	0.05234	10.25	<.0001	0.15	0.00
MathCAT	α_2	8.0791	4.4723	1.81	0.0713	0.00	0.03
ReadCAT	α_3	30.0447	4.6124	6.51	<.0001	0.06	0.10
TRTGroup	α_4	45.8669	16.6811	2.75	0.0061	0.01	0.16

Table B.12: Estimated Random Effects in the Final Cross-Sectional Model

Variance Component	Estimate	SE	*z*-value	*p*-value
σ^2	48303	2579.61	18.72	<.0001
τ_{00}	664.58	636.01	1.04	0.148

Table B.13: Fit Indices for the Final Cross-Sectional Model

	-2 (log-likelihood)	AIC	BIC
Final Model	9651.0	9665.0	9665.6