Abstract Title Page
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Title:
Efficacy of an Individualized Reading Intervention with Secondary Students

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Abstract Body

Limit 4 pages single-spaced.

Background / Context:

Description of prior research and its intellectual context.

The evidence base for intervening with adolescent-aged readers encompasses a number of small-scale, investigator-led studies (Kamil, Borman, Dole, Kral, Salinger, & Torgesen, 2008; Roberts, Torgesen, Boardman, & Scammacca, 2008). Findings indicate that older students who struggle with word-level skills benefit from systematic instruction in decoding (Archer & Gleason, 2003; Scammacca, et al., 2007) and multi-syllabic words (Carlisle & Stone, 2005; Nagy, Berninger & Abbott, 2006) prior to or along with instruction in vocabulary (Baumann, Kame'enui, & Ash 2003) and comprehension strategies (Edmonds et al., 2009; Klingner, Vaughn, & Boardman, 2007). As word-level fluency improves, greater effort can be devoted to understanding what is read because fewer resources are necessary for the mechanics of identifying words (Kuhn & Stahl, 2000; National Institute of Child Health and Human Development, 2000; Reutzel & Hollingsworth, 1993), creating opportunities for improved comprehension. Older readers who are fluent, but nonetheless struggle with comprehension, may benefit from strategy instruction on monitoring, summarization, question generation, and related strategies, although strategy-related effects may be conditional on more substantive cognitive structures (Willingham, 2007) or on students' developmental status (Cantrell, Almasi, Carter, Rintamaa, & Madden, 2010). Students who read with adequate fluency tend to read more words overall (Torgesen, 2005), are more motivated to read for information, and have increasingly greater access to the conceptual and background knowledge necessary for processing of complex text (Stanovich, 1986), compared to less fluent readers. Studies comprising the above research focus largely on the effectiveness of one or two instructional components or strategies.

Large-scale, randomized trials featuring the above practices have been less encouraging. For example, Chamberlain, Daniels, Madden, and Slavin (2007) found no statistically significant differences on the Gates-MacGinitie comprehension subtest (ES = 0.11) after a year-long randomized implementation of *Reading Edge*, a *Success For All*–aligned comprehensive school-wide literacy model developed for use in 6th grade. There were no differences (ES = -0.09) in the posttest reading comprehension for students (4th through 6th grade) participating in an intensive, research-based after-school intervention program (Kim, Samson, Fitzgerald, & Hartry, 2010). Vaughn and colleagues (Vaughn,Wanzek, Wexler, Barth, Cirino, Fletcher, Romain, Denton, Roberts, & Francis, 2010) reported no effects for a yearlong trial of a 50-minute daily intervention provided to at-risk middle school students. An evaluation of *Enhanced Reading Opportunities* found no statistically significant differences between two treatment groups and a business as usual condition on oral language vocabulary-related outcomes and very small differences on a measure of reading comprehension (ES = 0.09) (Somers, Corrin, Sepanik, T, Levin, & Zmach, 2010). Lang et al. (2009) provided 90-minutes of daily intensive reading interventions to older struggling readers over a 9-month period and found that low performing readers made no statistically significant gains in reading comprehension. Denton, Wexler, Vaughn, and Bryan (2008) reported similar results in a sample of middle school students provided with daily intensive intervention over the course of a school year (ES = 0.10).

A confluence of design- and program-related factors may account for differences in these two general groups of findings, and possibilities in this respect are increasingly prevalent in scholarly sources. The project (R324A100022) summarized in this paper contributes to this ongoing discussion by investigating the impact (i.e., randomized design) of a comprehensive,

responsive intervention that combines a multi-component reading program with a school engagement, dropout prevention initiative for at-risk and struggling high school students. We summarize selected findings from year 1.

Purpose / Objective / Research Question / Focus of Study:

Description of the focus of the research.

The study evaluates the efficacy of an intensive, reading intervention, a dropout prevention intervention, and an intensive, reading intervention plus dropout prevention on high school students' reading achievement and rates of dropout/school engagement. This paper focuses on the reading intervention and on reading outcomes. Data on the drop out intervention continues for the next 2 years. Our research questions include:

(1) What is the efficacy of an intensive reading intervention, with adolescent struggling readers compared with a well-documented, school-implemented comparison group on posttest reading performance?

(2) What is the moderating effect, if any, of primary language status and special education status?

Setting:

Description of the research location.

Three diverse high schools in a large urban southwestern US district participated in the study, with approximately a third of the sample from each site. In the sampled schools, approximately 43.11% of students are Hispanic, 25.51% are White, 19.44% are African American, 7.85% are Asian, and 4.06% are Native American or biracial. Additionally, 42.6% of students in participating schools are economically disadvantaged. The schools are rated as Academically Acceptable for the 2010-2011 school year.

Population / Participants / Subjects:

Description of the participants in the study: who, how many, key features, or characteristics.

Demographic details for *sampled students* (n = 375) are reported in Table 1. The majority of students are male (60.8%, n = 228) and Hispanic (44.3%, n = 166). An additional 17.6% (n =66) are Anglo, 33.1% (n =124) are African American, and 5.1% (n =19) are Asian. Of the 375 students, 66 (17.6%) receive special education services (34 in the treatment and 32 in the control condition) and 70 are English Language Learners (30 in the treatment and 40 in the control condition).

Intervention / Program / Practice:

Description of the intervention, program, or practice, including details of administration and duration.

Description of reading intervention:

Students in the reading conditions were provided a daily, 50 minute reading intervention class (Reading Interventions for Adolescents [RIA]) in groups of approximately 10 students that took the place of an elective. Students in the comparison and DO only conditions participated in an elective class such as art, music, athletics, or a foreign language. REWARDS (Archer, Gleason, & Vachon, 2003) review lessons provided the content for advanced word study. To address comprehension, we developed a series of 8-day instructional units aligned with recommendations from the recently published IES Adolescent Literacy Practice Guide (Kamil, et al., 2008) and implemented according to the principles of Collaborative Strategic Reading (CSR; Klingner, Vaughn, Dimino, Schumm & Bryant, 2001). CSR is a reciprocal teaching model where

students learn the principles of effective thinking (about text in this case) by participating, initially, with a group as the teacher explicitly "thinks aloud" about a given passage. Over time, individual students take over the "think aloud" role, and the teacher plays an increasingly consultative role. Textbooks from students' English language arts, social studies, and science classes provided expository passages used in the 8-day units. Curriculum-based measures assessed content acquisition and vocabulary. The 8-day units were developed for instructional *groups* (versus *individuals*) and can be conceptualized as a "standard protocol." However, their delivery in the CSR-affiliated model required a more responsive instructional stance, where teachers and students actively and transparently collaborated around the processing, comprehending, and using of text according to the strengths and learning needs of the students comprising each group.

Research Design:

Description of the research design.

We conducted a randomized field trial to compare the effects of an intensive reading intervention with secondary students. Students who qualified for the study ($N = 457$) were randomly assigned to 1 of 4 conditions: (1) reading intervention only (R only), (2) dropout prevention intervention only (DO only), (3) reading plus dropout prevention intervention (R+DO), (4) a business as usual comparison condition (BAU). After assent and attrition, in the Fall of 2010 prior the intervention started, we had 86 students enrolled in the R only condition, 104 students enrolled in the DO only condition, 84 students enrolled in the R+DO condition, and 101 students enrolled in the BAU condition. Intervention was provided to students during their 9th grade year (2010-2011) and will continue during their 10th (20110-2012) grade year. This paper reports the effects of the first year of reading intervention.

Data Collection and Analysis:

Description of the methods for collecting and analyzing data.

Data Collection: Students in the bottom 25th percentile on the prior-year's state high-stakes test were eligible for participation. Pretest occurred within the first month of school when intervention began and posttest during the last month of school. Trained project staff collected data. Researchers did not disclose treatment condition to test administrators. The reading achievement battery included the Test of Word Reading Efficiency (TOWRE; Torgesen, Wagner, & Rashotte, 1999), AIMSweb Maze (AIMSweb Maze-CBM, 2009), and the Gates-MacGinitie Reading Test (Gates & MacGinitie, 2000).

Data Analysis: We compared students in the reading treatment groups (R only group or to the R+DO group) to the students in the reading comparison groups (DO only group or to the business-as-usual control group). The multilevel effects of reading intervention on students' reading performance were estimated using multilevel modeling in MLwIN 2.23 (Rasbash, Steele, Browne, & Goldstein, 2009). We initially fit three-level models fit for each of the reading outcome variable to adjust for the clustering of students within classes and within school. Given the very small between-classes variance (between 0 - 5.6% of the total variance), two-level models, with students nested in classes, were subsequently fit. Pretest scores centered on the grand-mean as level-1 covariates (Enders & Tofighi, 2007). The effect of treatment was modeled as a level-2 covariate. We calculated effect size as the ratio of the model-derived coefficient for treatment to the unadjusted pooled within-group standard deviation across conditions at posttest (i.e., Hedges' g).

Findings / Results:

Description of the main findings with specific details.

Treatment effects (Research Question 1). Table 2 presents means and standard deviations for each group at pretest and posttest. Fixed and random effects for the random intercept model with Level 1 covariates are presented in Table 3. Students in treatment group (see Table 3) outperformed students in the control group on the Gates-MacGinitie Comprehension subtest ($\gamma_{01} = 3.05$, $SE = 0.94$, $t = 3.24$, $p < .05$). This is equivalent to an effect size of .26 (Hedges' g). Results were similar for the TOWRE Phonemic Decoding subtest, although the treatment effect estimate was somewhat smaller ($\gamma_{01} = 1.60$, $SE = 0.79$, $t = 2.02$, $p < .05$; Hedges' g = .12). Differences on the remaining reading measures (including Gates-MacGinitie Vocabulary subtest, TOWRE Sight Word subtest, and AIMSweb Maze) were not statistically significant.

Student-level differences in treatment effect (Research Question 2). Treatment effects did not differ for English Language Learners (ELL) or for students with special needs status (see Table 3). The main effect of special education status was significant for Aims Web ($\gamma_{03} = -3.37$, $SE = 1.72$, $t = -1.96$, $p < .05$) and TOWRE Sight Word ($\gamma_{03} = -2.52$, $SE = 1.24$, $t = -2.03$, $p < .05$) indicating that students with special needs scored significantly lower on these two tests than non-special needs children regardless of treatment condition.

Attrition bias. To determine whether attrition threatens the internal validity of the study we compared the characteristics of those remaining in the study across different treatment conditions (Cook &Campbell, 1979). Findings indicated no condition x attrition status interaction for any of the primary variables (Gates-MacGinitie, TOWRE, AIMSweb), suggesting that study attriters did not differ significantly at time 1 across conditions.

Conclusions:

Description of conclusions, recommendations, and limitations based on findings.

We summarize selected findings from year 1 of an ongoing IES-funded study on reading intervention and dropout prevention, with a focus on main effects of an integrated, data-driven model of reading instruction with older struggling readers, 9th graders in this case. Earlier investigator-led research with struggling older readers has focused on discrete components of effective instruction. Larger, randomized studies in similar populations of students have generally taken a more programmatic approach (i.e., multi-component), though these programs tend to constrain opportunities to respond to students' instructional needs. Because larger-scale implementations tend to result in lower levels of treatment fidelity (and higher levels of "contamination" of the counterfactual), programs in such settings often become routinized as a means of promoting fidelity (effectively so). However, the loss of responsiveness that accompanies increased standardization may diminish treatment effects for at-risk students. We test the effect of a responsive reading intervention in a relatively large-scale randomized trial.

Appendices

Not included in page count.

Appendix A. References

References are to be in APA version 6 format.

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

Table 1

Student demographics

Characteristics	Overall (*n* = 375)		Treatment (*n* = 170)		Control (*n* = 205)	
	n	%	*n*	%	*n*	%
Gender						
Male	228	60.8	105	61.8	123	60
Female	147	39.2	65	38.2	82	40
Ethnicity						
Anglo	66	17.6	32	18.8	34	16.6
African American	124	33.1	58	34.1	66	32.2
Hispanic	166	44.3	74	43.5	92	44.9
Asian	19	5.1	6	3.5	13	6.3
English Language Learners	70	18.7	30	17.6	40	19.6
Special education	66	17.6	34	20	32	15.7

Table 2

Means and standard deviations for reading measures across pretest and posttest

Reading measures	Pretest		Posttest	
	M	*SD*	*M*	*SD*
Gates Comprehension				
Treatment	88.6	12.6	89.5	11.8
Control	91.7	11.1	88.7	11.8
Gates Vocabulary				
Treatment	89.1	9.47	88.0	12.2
Control	89.8	9.14	89.4	12.3
TOWRE Phonemic Decoding				
Treatment	88.9	11.4	93.2	13.1
Control	91.1	12.6	94.5	13.8
TOWRE Sight word				
Treatment	88.0	9.62	91.1	10.4
Control	89.5	9.75	91.9	10.0
AIMS Maze				
Treatment	96.8	12.1	101	12.1
Control	100.0	11.3	102	11.8

Table 3

Multilevel model of fixed and random effects for reading outcomes

Fixed Effects			Random effects	
			Students within school	Students
	Predictor	Estimate		
Gates Comprehension	Intercept	87.41 (.63)[a]	.00 (.00)	72.67 (5.57)
	Pretest	0.69 (.04)		
	Treatment[b]	3.05* **(**0.94**)**		
Gates Vocabulary	Intercept	88.91 (.64)	.06 (.58)	73.57 (5.65)
	Pretest	0.95 (.05)		
	Treatment	-0.47 (0.93)		
TOWRE Sight Word	Intercept	91.36 (.45)	.00 (.00)	36.95 (2.84)
	Pretest	0.81 (.03)		
	Treatment	0.63 (.67)		
TOWRE Phonemic Decoding	Intercept	93.33 (.57)	.15 (.50)	50.56(3.93)
	Pretest	0.96 (.03)		
	Treatment	1.60* (.79)		
AIMS	Intercept	101.75 (1.56)	6.09 (5.49)	72.52 (5.57)
	Pretest	0.69 (.04)		
	Treatment	0.02 (0.93)		

Note. [a] Standard errors are in parentheses; [b] Reference group is control; * < .05.