Abstract Title Page
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Title:

Findings from a three year treatment within a Response to Intervention framework for Students in Grades 6 with Reading Difficulties

Author(s):

Audrey Leroux
Sharon Vaughn, Ph.D.
Greg Roberts, Ph.D.
Fletcher, Jack, Ph.D.

Abstract Body

Limit 5 pages single spaced.

Background / Context:

Description of prior research and its intellectual context.

Research on multi-tiered, research-based reading interventions provides strong evidence for the critical role of early reading instruction and the benefits of early intervention for children who are struggling to learn to read (Blachman et al., 2004; Denton, Fletcher, Anthony, & Francis, 2006). Research on effective approaches for older students who have already experienced reading failure is less prevalent (Kamil et al., 2008). In particular, there are few experimental studies documenting the effects of multi-tiered approaches to improving instructional outcomes in reading for students in the middle grades. To address this need, we have engaged a series of NIH-funded randomized studies on the effects of multi-tiered interventions for students with reading disabilities in grades six through eight. This poster presents selected findings from that ongoing work.

Purpose / Objective / Research Question / Focus of Study:

Description of the focus of the research.

This poster extends previously reported research by addressing the question: "What are the effects of an intensive, small group, tutoring treatment in reading on the reading outcomes of students with significant reading disabilities who had little to no response to two previous years of intensive intervention?"

Setting:

Description of the research location.

The research was conducted in 3 highly diverse middle schools in Austin and Houston, Texas, with half of the total sample drawn from each of these two communities. Students who received treatment participated in the intervention for one 45-50 minute period during their regular school day.

Population / Participants / Subjects:

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

Students who received treatment in Year 3 (also called Tier IV in this abstract) were those who 1) participated in intensive Tier II intervention in Year 1 of the study, 2) participated in an additional Tier II intervention in Year 2 (either standardized or individualized protocol), *and* 3) met the criteria for nonresponse in Years 1 and 2. Students met the end-of-year-year-one criteria for nonresponse if they scored less than 2100 scaled scored points (i.e., one-half of a standard error above the passing cut score) on the Texas Assessment of Knowledge and Skills (TAKS), *or* scored less than 90 standard scored points on the Woodcock Johnson III Letter-Word Identification assessment at posttest, *or* scored less than 90 standard scored points on the GRADE Comprehension Composite assessment at posttest (response status was determined only for students who regularly attended the treatment classes). The same criteria were used to determine nonresponse at the end of year 2, with the exception that students must have scored

less than 2150 scaled scored points on the TAKS (one standard error above the cut score), instead of 2100. Thirty students participated in the year 3 intervention. Students in the comparison group were randomly assigned to the "business as usual" condition in year 1 of the study (also called Tier I in this abstract) *and* met the same end-of-year criteria for nonresponse as treated students. In Year 3, there were 12 students in this comparison group.

Of the students followed all three years of the intervention:

- 46% were male and 54% were female,
- 21% were identified as having limited English proficiency,
- 43% were African American, 8% were Caucasian, and 49% were Hispanic, and
- 86% received free or reduced lunch.

Intervention / Program / Practice:

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

During the first year of the study we provided a year-long, intensive intervention (over 100 hours) to students in the treatment condition (see Vaughn et al., 2010). The intervention was implemented by tutors who were trained, coached, and supervised by the researchers. Instructional intensity was manipulated by controlling group size (i.e., small group instruction). In year 2, non-responding students in the treatment group were randomized to a standard or individualized protocol. Tutors were trained, coached, and supervised by the research team (see Vaughn et al., in review). The standard protocol was developed by the investigative team. The individualized protocol was less structured; tutors were provided with instructional options and coached on selecting appropriate strategies based on individual student need. The 3rd year of treatment, or Tier IV, was an individualized intervention protocol implemented daily in 45-50 minute periods for an entire year. This intervention incorporated the effective elements of a scientifically based reading intervention including very intensive instruction in word study, fluency, vocabulary, comprehension, text reading, and a motivation component. Teachers were allowed a degree of flexibility in responding to the instructional needs of individual students in their assigned groups. Teachers were also provided with intensive support in using data from curriculum based measures to assess mastery and plan ongoing instruction. Details on the treatment protocols for each year of the study are available at texasldcenter.org.

Research Design:

Description of research design (e.g., qualitative case study, quasi-experimental design, secondary analysis, analytic essay, randomized field trial).

The general design is a multi-gated, longitudinal, randomized trial with increasingly intense tiers of intervention as described earlier in this abstract. At-risk sixth-graders in year 1 of the study were included in the sample for this study. This poster presents findings from year 3, when the targeted cohort was in 8th grade. While the "business as usual" group (Tier I) was determined using the same end-of-year nonresponse criteria used with treatment condition and, as such, represent the best of available counterfactuals, remember that treatment condition students in year 3 of the study had the benefit of two prior years of intervention. In other words, students in both groups were low-responders based on the end-of-year criteria; however, participants in the treatment condition may have been advantaged prior to the year 3 study.

Data Collection and Analysis:
Description of the methods for collecting and analyzing data.

The following measures were administered in year 3 of the study:

- Woodcock-Johnson III Word-Attack and Letter-Word Identification (WJ-III; Woodcock, McGrew, & Mather, 2001);
- Sight Word Efficiency and Phonemic Decoding Efficiency subtests from the Test of Word Reading Efficiency (TOWRE; Torgesen, Wagner, & Rashotte, 1999);
- AIMSweb Reading Maze (Shinn & Shinn, 2002);
- Test of Sentence Reading Efficiency (TOSRE; Wagner et al., 2010);
- Gates MacGinitie Passage Comprehension; and
- Passage Comprehension subtest of the Woodcock-Johnson III Tests (WJ-III; Woodcock, McGrew, & Mather, 2001).

Psychometric information on these measures is available at texasldcenter.org.

Descriptive analyses were used to evaluate Year 3 pretest and posttest outcomes for the students in the intervention condition and for students in comparison group. Analysis of covariance was used to evaluate statistical significance and the Benjamini-Hochberg procedure was used to control for inflated Type I error.

Findings / Results:
Description of the main findings with specific details.

Descriptive statistics are presented for the treatment (Tier IV) group in Table 1a and for the comparison (Tier I) group in Table 1b for pretest and posttest. Absolute differences in pretest and posttest means for each measure and for each condition are provided; differences in pretest and posttest performance are also expressed in standardized units (Hedge's g for repeated measures using the small sample correction) for each group. Measures are organized according to domain. Domains include: comprehension, fluency, and word reading accuracy. For the treatment group, there is a general pattern of improvement on all measures from pretest for posttest, with the exception of the Woodcock-Johnson III Letter-Word and Word-Attack subtests. In the comparison group, means at posttest are lower than pretest means, except on the Aimsweb Mazes measure, where there is a large increase from pretest to posttest.

In the analyses of covariance, the pretest score was used as the covariate. There were statistically significant differences between treatment and comparison groups on the Gates-MacGinitie assessment, with adjusted posttest means of 18.52 and 12.95, respectively ($F(1, 37) = 10.543$, $p = .002$). Differences on the Woodcock Johnson III Letter-Word Identification subtest, ($F(1, 36) = 6.564$, $p = .015$) and on the TOWRE Phonemic Decoding subtest ($F(1, 36) = 5.114$, $p = .030$) were also statistically significant. However, differences on the TOWRE Phonemic Decoding were not significant when Type I error rate was controlled using the Benjamini-Hochberg correction.

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

While students in the Tier IV condition appear to benefit from year-3 treatment, they do not close the gap with the group of typically performing peers. Instead, the benefit derives

largely from the continuing downward trend of students in the Tier I condition compared to the relatively steady performance of the students in the treatment group. The findings suggest that the most at-risk older readers may be able to maintain their status relative to their average age-mates when provided with intensive, daily intervention across the school year; however, these results do not indicate that treated students "catch up" to normative 8th grade reading levels.

The sample in this study is small, though not unusually so for studies of this type. The comparison group is a represents a reasonable counterfactual. However, given the longitudinal nature of the design and the fact that students in Tier 1 were initially randomized two years prior to the reported study, there may be some questions concerning internal validity.

Appendices

Not included in page count.

Appendix A. References

References are to be in APA version 6 format.

Blachman, B. A., Schatschneider, C., Fletcher, J. M., Francis, D. J., Clonan, S., Shaywitz, B., & Shaywitz, S. (2004). Effects of intensive reading remediation for second and third graders. *Journal of Educational Psychology, 96,* 444–461.

Denton, C. A., Fletcher, J. M., Anthony, J. L., & Francis, D. J. (2006). An evaluation of intensive intervention for students with persistent reading difficulties. *Journal of Learning Disabilities, 35,* 447–466.

Kamil, M., Borman, G., Dole, J., Kral, C., Salinger, T., Torgesen, J., et al. (2008). Improving Adolescent Literacy: Effective Classroom and Intervention Practices. IES Practice Guide. NCEE 2008-4027.

Vaughn, S., Cirino, P., Wanzek, J., Wexler, J., Fletcher, J., Denton, C., et al. (2010). Response to intervention for middle school students with reading difficulties: Effects of a primary and secondary intervention. *School Psychology Review*, *39*(1), 3-21.

Vaughn, S., Wexler, J., Roberts, G., Barth, A. E., Cirino, P. T., Romain, M., . . . Fletcher, J. M. (in review). The effects of tertiary treatments on middle school students with reading disabilities: Individualized versus standardized approaches.

Appendix B. Tables and Figures

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Table 1a. Treatment (Tier IV) Student Outcomes

	Pretest			Posttest			
Year 3 Measures	**Mean**	**N**	**Std. Deviation**	**Mean**	**N**	**Std. Deviation**	**Effect Size**
Gates MacGinitie Passage Comprehension	17.39	28	5.3	18.43	28	4.6	0.18
Woodcock Johnson III Passage Comprehension	83.00	28	10.3	84.39	28	9.5	0.24
Aimsweb Mazes	171.75	28	48.8	192.25	28	56.0	0.38
TOSRE	71.50	28	6.5	75.86	28	10.4	0.46
TOWRE Phonemic Decoding	85.57	28	14.7	87.07	28	14.7	0.14
TOWRE Sight Word	89.93	28	9.8	90.93	28	10.5	0.10
Woodcock Johnson III Letter-Word Identification	89.39	28	11.6	89.36	28	9.7	-0.01
Woodcock Johnson III Word Attack	89.64	28	8.8	88.96	28	9.4	-0.13

Note: All measures are standard scores ($M = 100$, $s = 15$), except the Gates-MacGinitie Passage Comprehension and Aimsweb Mazes, which are indicated using raw scores.

Table 1b. Comparison (Tier I) Student Outcomes

	Pretest			Posttest			
Year 3 Measures	**Mean**	**N**	**Std. Deviation**	**Mean**	**N**	**Std. Deviation**	**Effect Size**
Gates MacGinitie Passage Comprehension	19.17	12	5.6	13.17	12	5.7	-0.69
Woodcock Johnson III Passage Comprehension	79.45	11	16.4	78.91	11	11.9	-0.08
Aimsweb Mazes	145.83	12	30.1	179.17	12	50.5	0.91
TOSRE	74.00	12	11.5	72.33	12	13.8	-0.18
TOWRE Phonemic Decoding	87.09	11	15.2	80.91	11	12.6	-0.96
TOWRE Sight Word	82.91	11	11.2	82.45	11	9.8	-0.07
Woodcock Johnson III Letter-Word Identification	86.36	11	14.9	81.73	11	12.6	-0.59
Woodcock Johnson III Word Attack	89.18	11	10.8	85.36	11	12.3	-0.48

Note: All measures are standard scores ($M = 100$, $s = 15$), except the Gates-MacGinitie Passage Comprehension and Aimsweb Mazes, which are indicated using raw scores.

Table 2. ANCOVA Results

	Adjusted Posttest Means				
Year 3 Measures	**Tier IV (Treatment)**	**Tier I (Comparison)**	***F*-statistic**	***p*-value**	**partial η^2**
Gates MacGinitie Passage Comprehension	18.52	12.95	F(1, 37) = 10.543	.002	.222
Woodcock Johnson III Passage Comprehension	83.67	80.76	F(1, 36) = 2.499	.123	.065
Aimsweb Mazes	187.08	191.24	F(1, 37) = .063	.804	.002
TOSRE	76.48	70.88	F(1, 37) = 2.958	.094	.074
TOWRE Phonemic Decoding	87.39	80.10	F(1, 36) = 5.114	.030*	.124
TOWRE Sight Word	89.68	85.62	F(1, 36) = 1.743	.195	.046
Woodcock Johnson III Letter-Word Identification	88.76	83.24	F(1, 36) = 6.564	.015	.154
Woodcock Johnson III Word Attack	88.85	85.66	F(1, 36) = 2.209	.136	.058

*Not significant with Benjamini-Hochberg Correction of the statistical significance of effects with multiple comparisons
Note: All measures are standard scores (M = 100, s = 15), except the Gates-MacGinitie Passage Comprehension and Aimsweb Mazes, which are indicated using raw scores.