Abstract Title Page
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Title:

The Targeted Reading Intervention (TRI): A Classroom Teacher Tier 2 Intervention to Help Struggling Readers in Early Elementary School.

(Paper submitted as part of the symposium
Evidence for Interventions for Struggling Readers
Chaired by Robert E. Slavin)

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Abstract Body

Limit 5 pages single spaced.

Background/context:

Although most children learn to read during early elementary school through a variety of effective reading instructional programs delivered by the classroom teacher, some children do not seem to profit from regular classroom instruction in reading. It has generally been acknowledged that there are two groups of children who are at highest risk for reading failure when exposed only to regular classroom instruction in reading (Whitehurst & Lonigan, 1998; Foorman & Torgesen, 2001). The first group comes to school with adequate oral language skills but has trouble with the processes involved in the relationship between oral language and the printed word. The second even larger group is characterized by problems in both oral language/vocabulary and print related/phonological knowledge. This latter group is composed mostly of low-income children who come to school without the prerequisite experiences in emergent literacy to allow them to profit from most whole class instructional practices (Snow, Burns & Griffin, 1998; Vernon-Feagans, in press). A smaller but interesting group of children who have been reported to have persistent reading problems are children who have problems in rapid naming and phonological knowledge (Wolf & Bowers, 1999). Although there is controversy about whether such a group exists and how independent the two skills are from each other (Vukovic & Sigel, 2006), there is evidence that both skills, phonological knowledge and rapid naming, have been linked to poorer reading in young children (Katzier, Kim, Wolf, Morris & Lovett, 2008).

A rather understudied group of children who are at risk for suboptimal academic achievement are children who live in rural areas of the United States. A greater percentage of children in rural areas live in poverty compared to children from urban/suburban areas and they are poorer than children in urban/suburban areas (US Census Bureau, 2001). Children from minority families in rural communities have almost double the poverty rates of children in urban/suburban areas. About one third of all schools are located in rural areas and about 20% of all school age children attend rural schools in this country (NCES, June, 2007); yet there is very little information about how they might differ from urban and suburban schools and whether specific interventions are more or less effective in rural schools. In an analysis of school entry for the children in the ECLS-K sample, Lee & Burkham (2002) found that rural children performed more poorly at school entry and had less access to high quality schools and teachers than children in the suburbs. Many rural school districts have struggled to recruit and retain highly qualified teachers (Collins, 1999; Reeves, 2003), with teacher pay about 80% of what urban teachers make (National Education Association, 2005). These factors together may put children in rural areas at risk, especially in rural areas where there is high poverty and geographic isolation. Thus, it is important to develop strategies that might aid rural schools and classroom teachers become more effective with children at risk for reading failure who in early elementary school might be targeted for Tier 2 interventions by the regular classroom teacher (National Joint Committee on Learning Disabilities, 2005).

Research and intervention studies in a variety of contexts over the last 20 years have shown that children who are at risk for reading failure can be helped through more explicit and intensive instruction in reading (Torgesen et al., 1999; 2001, 2007; Mathes et al.2005), usually delivered outside of the regular classroom. For instance in a recent randomized clinical trial of

four reading programs for struggling readers in elementary school (Torgesen et al., 2007) there was evidence that together these interventions programs delivered by a trained specialist teacher could improve the reading outcomes for these children. Children from low income families and children with phonological awareness problems progressed the least. In addition, a number of scholars have reviewed the intervention studies on children with reading difficulties with the aim of synthesizing the reading intervention components that appear to be most successful in promoting the reading success for these children.

Foorman & Moats (2004) summarized the elements of the most effective instruction to prevent reading failure in young children with reading difficulties. They stressed the importance of three basic elements, including: explicit instruction in the alphabetic principle and related processes, while at the same time integrating these processes with reading for meaning; early intervention/prevention efforts in the first few grades in school; and small group/and or one on one intensive instruction Foorman & Torgesen (2001) also stressed these factors in their review of the literature, but also included a fourth important element: an effective emotional and cognitive relationship between the teacher and the child with reading difficulties, a relationship that has recently been shown to be important for academic success in the early grades for all children (Hamre & Pianta, 2005). Finally a fifth factor has been stressed by a number of studies and reviews of the literature: instruction that is matched to the child's level of skill, or assessment based intervention (Foorman & Torgesen, 2001; Morrison, Bachman & Connor., 2005; Vernon-Feagans, Gallagher & Kainz, in press). Although many educators have endorsed individualized instruction that meets the needs of different children in programs like *Reading First,* most reading instructional programs do not offer specific strategies that match the level of the child's literacy skills. This match between skills and instruction may be particularly important for struggling readers who come to school without the preliteracy skills that allow them to profit from many general reading programs (Connor et al., 2007). Foorman & Torgesen (2001) propose that struggling readers need the same set of skills as other children but they will need more effective and more intensive instruction that considers the interaction of child characteristics with specific characteristics of the instruction. Thus, reading failure is seen as not just a child characteristic, but involves a 'mismatch' between child skills and the instruction. This mismatch is particularly difficult to eliminate with a standard curriculum that may not stress individualizing instruction.

Purpose/objective/research question/focus of study

The following two studies were designed to test the effectiveness of a new diagnostic-based reading intervention for classroom teachers, called the Targeted Reading Intervention (TRI). This TRI Tier 2 intervention stressed diagnostic teaching as the key to helping struggling readers make rapid progress in reading in the regular classroom. Unique to this intervention, compared to other interventions, was the use of the classroom teacher as the primary source of delivering the intervention in one on one fifteen minutes sessions in the regular classroom, with the biweekly support of our TRI literacy consultant and an on-site consultant. The length of time each week of this intervention was less than in other studies that used specially trained teachers to work with students for more time outside of the regular classroom (Mathes et al., 2005; Morris, Tyner, & Perney, 2000; Torgesen et al., 1999; 2007), yet its diagnostic approach was more efficient in targeting the key areas of difficulty for each child.

In Study 1 we wanted to understand whether the intervention was effective for struggling readers and under what conditions and for whom was the intervention most beneficial. We hypothesized that our classroom intervention for struggling readers would benefit basic word

identification and vocabulary skills of the experimental children as compared to the control children. We also hypothesized a number of interactions with the intervention, such that children from low income families and minority children would benefit as much as other children unlike some other interventions (Torgesen et al., 2007) and that children who had poorer phonological awareness and poorer rapid naming would also benefit as much as other children receiving the TRI (Wolf & Bower, 1999). In Study 2, we wanted to understand if our intervention could have an effect when it was delivered via technology, using webcams that allowed real time consultation in the regular classroom where our consultants could see and hear the teacher working with individual children.

Setting:

Study 1: Schools and Teachers. This study included 6 elementary schools in two rural poor counties in the Southeastern United States. Four schools participated in one county and two others in another county, both of which were low wealth and rural counties. There were 14 experimental classrooms and 18 control classrooms. Consistent with literature on rural schools, these teachers had many years of classroom experience but their advanced education was less than might be expected for their years of teaching.

Study 2: Schools and Teachers. This study included two schools in rural Texas and two in rural New Mexico. The teachers in this study had slightly less experience but more advanced degrees than in study 1. There were 26 experimental and 17 control classrooms.

Population/Participants/Subjects:

Students. The overall profile of the students in the study schools was diverse. Minority students comprised 45% to 60% of the students in the schools, and most of the students (56%-100%) were eligible for free and reduced lunch. There were 439 children in study 1 and 364 in Study 2.

Intervention/Program/Practice:

Overall Intervention. The TRI included all five elements discussed in the literature review that were specific components that appeared to be effective with struggling readers. The TRI was delivered in one on one (and sometimes small group) sessions by the classroom teacher in kindergarten and first grade with the guidance of both an on-site literacy consultant and one of our TRI literacy consultants. The teacher worked with **five** struggling readers over the course of the academic year. We stressed teacher/child dialogue and feedback as a way to motivate and engage children in the learning process. We especially stressed the match between the child's skills and the instruction that was delivered to the child to ensure success in each session, using assessment tools that were linked with specific reading strategies in a continuous diagnostic teaching cycle. The teacher began by working with one struggling reader and providing that child with 15 minute sessions four days a week until the child began to make rapid progress in reading. The teacher then went on to another struggling reader and began working with the first child in a small group context.

In the context of a 15 minute one on one TRI lesson, the classroom teacher led a student through three TRI components: *Re-Reading for Fluency* (about 2 minutes), *Word Work* (about 6 minutes), and *Guided Oral Reading* (about 7 minutes). The teacher strategies used in each of these three components were geared to help students who demonstrated great difficulties with beginning reading to progress rapidly in reading (e.g., Morris et al, 2000; Shanahan & Barr, 1995). Students moved flexibly into and out of TRI time with their teacher, allowing the teacher

to meet the needs of multiple struggling readers across the school year. All five children were informally assessed throughout the school year to maintain their progress in reading.

Study 1: Study 1 delivered the intervention through a 3 day face to face summer institute and biweekly face to face visits by TRI consultants during the academic year. These TRI consultants worked with the teacher in the regular classroom as she implemented TRI strategies with struggling readers and attended grade level meetings where joint problem solving was employed for particular struggling readers. When the TRI consultant was not available a trained on site consultant was available to help classroom teachers.

Study 2: Study 2 delivered the intervention through a 3 day face to face summer institute but biweekly classroom consultation and grade level meetings were conducted through innovative technology. Each experimental teacher received a laptop computer and a webcam. The TRI consultant was thousands of miles away in a university office but could see and hear the teacher working with each struggling reader in the classroom . The teacher could equally see and hear the TRI consultant. In this way, training and consultation could take place in real time over the specific issues related to a particular student. This delivery of intervention was extremely cost effective for remote rural areas but we wanted to know if the delivery system was as effective as the face to face consultation.

Research Design:

Both Study 1 and Study 2 were randomized control trials where randomization was at the school level. Because of the small number of schools, pair matching was done on school size, % free and reduced lunch, % African American and involvement in Reading First before randomization. In Study 1 there were 6 schools and in Study 2 there were 4 schools randomly assigned to treatment or control. In each classroom teachers identified children who were below grade level and those who were at or above grade level, based on assessment data and teacher judgment in consultation with the TRI staff. From this pool of students, we randomly selected 5 struggling readers (focal children) and 5 non-struggling readers (non-focal children) in each experimental and control classroom.

Data Collection and Analysis:

All measures were administered to each child in the fall and spring of the school year by trained assessors. Two subtests of the *WJTA III* (2004) were administered to all children. *Word Attack* measures skill in applying phonic and structural analysis skills to the pronunciation of unfamiliar printed sounds and words. The *Letter-Word Identification* subtest measures the child's letter and word identification skills. *The Peabody Picture Vocabulary Test-Third Edition (PPVT-III)* (Dunn & Dunn, 1997) was individually administered to each child. The Comprehensive Test of Phonological Processing (CTOPP; Wagner, Torgensen & Rashotte, 1999) assesses phonological awareness, memory and rapid naming. These are thought to be core skills for each word identification.

Findings/Results:

In Study 1 we first examined whether the TRI gains across the year were similar for African American and non-African American children and similar for boys and girls. Preliminary analyses showed that that all groups gained similarly across the year.

In the second analysis (see Table 1), we controlled for mother's education, child gender, and child negative behaviors in order to understand if the experimental children made significant more gains than the control group on our outcomes measures. We also were interested in whether children with poorer phonological awareness would gain as much as other children and whether children with poorer rapid color naming would gain as much as other children. Overall we found significant intent to treat effects (collapsing across grade) for *Letter-Word Identification* on the Woodcock Johnson Tests of Achievement (WJ-III), with an effect size of .94. This was even more impressive because half of the schools were Reading First schools. We also found a significant interaction with Rapid Color Naming (RAN) on Word Attack (WJ-III). Children with low RAN scores gained the most from the TRI (Vernon-Feagans et al., 2008) (see Table 3, Appendix A).

Study 2 introduced laptops and webcams to deliver the TRI instead of face to face consultation between the classroom teacher and our TRI consultants. Two rural schools in Texas and two rural schools in New Mexico were randomly assigned to the intervention or control group as in Study 1. There were 440 children in this study. We have just completed the preliminary analyses of this past year's intervention and again we found intent to treat effects for Letter -Word Identification and Word Attack, with effect sizes from .28 to .40 (see Table 3, Appendix A). We were not able to detect differences on the Peabody Picture Vocabulary Test but hope to have greater power in the proposed TRI to detect possible effects. These preliminary findings suggest strong support for the effectiveness of the TRI in our future work.

Conclusions:

These studies suggest that professional development for classroom teachers in rural low wealth communities that focuses on diagnostic teaching in the regular classroom with struggling readers can make a dramatic difference in the gains these children make in one academic year. With the help of a biweekly literacy consultant who worked with the teacher in the regular classroom, the TRI Tier 2 intervention found effect sizes of almost 1 in Study 1 and effect sizes of about .5 in Study 2 when consultation was delivered by webcam technology. In both studies there was no evidence that normally progressing children were suffering because of the time teachers used to work with the struggling readers. In addition, this study also suggests that this diagnostic approach appears to help all children equally with no evidence that boys, African American children, or low-SES children gained less than other struggling readers. In addition, the interaction between rapid color naming and the intervention suggested that children with rapid color naming problems gained the most from the TRI, providing evidence that this kind of deficit may be particularly addressed in a diagnostic teaching format. Finally, this study demonstrates that low cost effective teacher professional development can dramatically improve the reading of struggling readers by biweekly consultation in the regular classroom either face to face or by very cost effective web cam technology that allows teacher and consultants to see and hear each other in real time as they work with a struggling reader.

Appendixes

Appendix A. References

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Appendix B. Tables and Figures

TRI Preliminary Findings

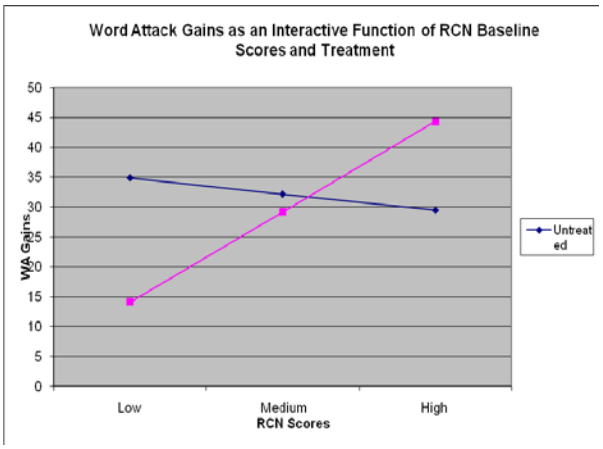
*Study **1**: Intent to Treat Effects for Growth in **Letter Word Identification***

Effect	*β*	(SE)	*p*	δ
Maternal Education	-0.84	(0.66)	ns	
Gender	2.03	(2.82)	ns	
CBI Hostility Score	-.91	(1.68)	ns	
CBI Distractibility Score	2.53	(1.83)	ns	
Rapid Color Naming (RCN) Score	-0.02	(0.03)	ns	
Phonological Awareness (PA) Score	-0.42	(2.24)	ns	
Experimental Status	**16.5**	**(5.09)**	**	**0.94**
Interaction Terms:				
RCN x Experimental Status	0.22	(0.17)	ns	
PA x Experimental Status	2.39	(5.83)	ns	
RCN x PA x Experimental Status	0.48	(0.25)	ns	

*Study **1**: Intent to Treat Effects for Growth in **Word Attack***

Effect	*β*	(SE)	*p*	δ
Maternal Education	-1.84	(0.83)	*	
Gender	-2.93	(3.51)	ns	
CBI Hostility Score	-3.31	(2.12)	ns	
CBI Distractibility Score	-0.13	(2.32)	ns	
Rapid Color Naming (RCN) Score	-0.07	(0.04)	ns	
Phonological Awareness (PA) Score	-6.16	(3.02)	*	@
Experimental Status	-2.40	(6.52)	ns	
Interaction Terms:				
RCN x Experimental Status	**0.43**	**(0.21)**	*	@
PA x Experimental Status	10.16	(7.12)	ns	
RCN x PA x Experimental Status	0.004	(0.31)	ns	

Note. Maternal education, gender, CBI hostility score, and CBI distractibility scores were entered into the model as covariates.
*p< .05, **p < .01.
@. Difficult to calculate effect sizes in the presence of an interaction (See graph below)



*Study **2**: Intent to Treat Effect for **Letter Word Identification***

Effect	*β*	(SE)	*p*	δ
Maternal Education	.38	.52	ns	
Gender	-2.27	2.23	ns	
CBI Hostility Score	2.22	1.34	ns	
CBI Distractibility Score	.09	1.39	ns	
Experimental Status	**5.49**	**2.67**	*	**.28**

*Study **2**: Intent to Treat Effect for **Word Attack***

Effect	*β*	(SE)	*p*	δ
Maternal Education	-.65	.56	ns	
Gender	-3.90	2.40	ns	
CBI Hostility Score	.42	1.44	ns	
CBI Distractibility Score	-.06	1.49	ns	
Experimental Status	**8.55**	**2.87**	**	**.40**

Note. Maternal education, gender, CBI hostility score, and CBI distractibility scores were entered into the model as covariates.
*p< .05, **p < .01.