Investigating the Efficacy of a Web-Based Early Reading and Professional Development

Intervention for Young English Learners

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Abstract

The purpose of this study was to evaluate whether the Targeted Reading Intervention (TRI), a professional development program and early reading intervention delivered via webcam technology could support English learners' early reading progress. Participants for the current study were drawn from a larger three-year randomized controlled trial and included 108 English learners (ELs) from 47 classrooms randomly assigned to treatment and control conditions. Teachers in treatment classrooms used the TRI in one-on-one sessions in the regular classroom for approximately 15 minutes per day. Weekly, and later, biweekly webcam coaching sessions between the TRI coach and each classroom teacher allowed the coach to interact with both the teacher and student in real time, and allowed classroom teachers to receive real-time feedback from the coach. Two-level hierarchical linear models suggested that ELs struggling with learning to read in intervention classrooms significantly outperformed their peers in control classrooms on word-level measures of early reading with effect sizes of .43 and .45, but not on text-level measures. Results also suggested that ELs struggling with learning to read were gaining at the same rate as their non-struggling peers, but they were not able to catch up within the study year.

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English learners (ELs) are a rapidly growing population in the United States (KewalRamani, Gilbertson, Fox, & Provasnik, 2007; National Center for Education Statistics, 2015a); from 2003 to 2013, the number of ELs in U.S. public schools grew from 4.1 million (8.7%) to 4.4 million (9.1%). According to the most recent data, almost 10% of public school students (approximately 4.3 million) in the United States participate in school-based programs for English learners (ELs; National Center for Education Statistics, 2015a), and an even greater number of students speak a language other than English at home (Kids Count Data Center, 2015).

At the same time, the early school years are critical for cognitive, academic, and social development (e.g., Takanishi, 2004). However, national assessments of ELs' early progress in reading suggest that, on average, ELs' reading achievement lags behind their native-English-speaking counterparts at fourth and eighth grades, and that a persistent achievement gap exists between the scores of students identified as EL and those identified as non-EL (National Center for Education Statistics, 2015b). In addition, ELs are often overrepresented in special education programs because of the difficulty in distinguishing between a disability and difficulty with reading in English related to language acquisition (Copeland, De Valenzuela, Park, & Qi, 2006; Sullivan, 2011).

In order to address EL's reading achievement, researchers have investigated effective reading interventions for ELs (Cheung & Slavin, 2005), including those in English, students' native language, or in two languages simultaneously (Ashdown & Simic, 2000; Escamilla, 1994; Escamilla, Ruiz-Figueroa, Hopewell, Butvilofsky, & Sparrow, 2010) Lyon and colleagues

(2001) assert that providing effective research-based early interventions could prevent up to 70% of all struggling readers from experiencing reading failure, or even from being identified for placement in special education. However, given limited budgets and personnel, recent emphasis has been placed on increasing the efficacy of classroom teachers' early reading intervention or instruction, particularly for children at risk of reading failure, such as young ELs.

Unfortunately, evidence shows that professional development programs for classroom teachers do not always result in significant reading gains for struggling readers (e.g., Garet et al., 2008). The exception is a small group of studies that employed individual students' diagnostic information to directly inform the basis for instructional practice (e.g., Amendum, Vernon-Feagans, & Ginsberg, 2011; Connor, Morrison, Fishman, Schatschneider, & Underwood, 2007; Scanlon, Gelzheiser, Vellutino, Schatschneider, & Sweeney, 2008; Speece, Case, & Molloy, 2003; Vernon-Feagans, Kainz, Hedrick, Ginsberg, & Amendum, 2013). In these studies, professional development provided to classroom teachers was related to students' gain in reading.

Therefore, the purpose of the current study was to evaluate the efficacy of a diagnostic early reading intervention and professional development program, the Targeted Reading Intervention (TRI), delivered by the classroom teacher for young English learners. Within a daily one-on-one instructional framework, the TRI uses a diagnostic teaching approach to help classroom teachers improve the reading skills of students who are struggling with reading acquisition, supported by a remote literacy coach using webcam technology, which allows real-time interaction and feedback to teachers during intervention sessions. Of note, the TRI was designed for use in the general education classroom to support classroom teachers and struggling readers and was not developed specifically for ELs. While some may view this as limitation, we

2

do not because effective interventions are likely to positively affect students with a diverse range of needs (August & Shanahan, 2010), including students who are ELs.

In the current study we asked the following questions: (a) Controlling for fall performance, do struggling English learners (ELs) in TRI classrooms demonstrate better spring performance on tests of early literacy compared to struggling ELs in non-TRI classrooms? (b) Does the spring performance of struggling ELs in TRI classrooms indicate that they are catching up to their non-struggling EL classroom peers? (c) Do struggling ELs in non-TRI classrooms exhibit slower growth rates compared with their non-struggling EL peers? (d) Is students' spring performance related to TRI treatment status or struggling reader status moderated by beginning of year oral vocabulary skills?

Guiding Frameworks

An ecological systems perspective (Bronfenbrenner, 1979; Bronfenbrenner & Evans, 2000) provides the overarching theoretical framework for the current study, and details the importance of *proximal processes* within the context of the classroom. Person-to-person interactions, specifically teacher-child interactions, are theorized as the primary drivers in children's development (Bronfenbrenner & Evans, 2000) and are central to helping teachers individualize instruction and to children's learning. Proximal learning interactions may be particularly important for EL students, whose reading success may depend on teachers' enhanced instruction during one-on-one positive interactions in the classroom.

Within this broad ecological systems perspective, we embed specific theories and corresponding instructional strategies for effective reading instruction. First, we primarily focus on automatic word recognition guided by automaticity theory (LaBerge & Samuels, 1974), which theorizes the importance of providing reading instruction in word-level decoding to

automaticity and subsequent oral reading fluency development, which are necessary, but not sufficient, for successful reading comprehension. Because of primary grades students' developmental stage of reading (Chall, 1996), much attention is given to instructional strategies for word recognition in these grades.

In addition, freeing cognitive resources accessible to students from automatic decoding does not alone produce comprehension; instead we draw on construction-integration (CI) theory (Kintsch, 1994) as we consider the beginnings of comprehension instruction; CI theory considers how three levels of representation interact to allow simultaneous meaning extraction and construction (RAND Reading Study Group, 2002). Given primary grades students' emerging abilities related to accessing Kintsch's levels of representation, the CI framework supplements the main focus on word recognition with beginning strategies for reading comprehension.

Issues Related to English Learners' Reading Development

ELs often work to attain multiple goals simultaneously: continued development of their native language, mastery of English, and academic content knowledge (Calderón, 2007; Coltrane, 2003). Given that English literacy development is an active process influenced by multiple individual differences (e.g., age, oral native language proficiency, native language literacy, oral English proficiency, cognitive ability, background knowledge, and the overlap between first and second languages) (August & Shanahan, 2006; Fitzgerald, Amendum, Relyea, & Garcia, 2015), teachers benefit ELs when they provide explicit instruction in English reading processes that address both word- and text-level skills (Francis, Rivera, Lesaux, Kieffer, & Rivera, 2006; Silverman, 2007; Vaughn et al., 2006). Most note the importance of aspects of oral language proficiency, such as vocabulary, and language comprehension for ELs' literacy development. However, research on the relationship between ELs' English oral language and

reading development is mixed. Some researchers find that English oral language ability is related to reading comprehension (Lesaux, Crosson, Kieffer, & Pierce, 2010) or reading level growth (Fitzgerald et al., 2015; Kieffer, 2012), while others find no relation between English oral language and aspects of reading (e.g., Y.-S. Kim, 2012).

Currently, school districts must demonstrate yearly academic gains for ELs as well as other subgroups of students (Every Student Succeeds Act, 2015). Instruction in the key components of reading at both the word- and text levels identified by the National Reading Panel (NICHHD, 2000) – phonemic awareness, phonics, fluency, vocabulary, and text comprehension – not only supports reading development for monolingual English-speaking students, but also benefits ELs' reading development (August & Shanahan, 2006). On average, ELs achieve similar performance compared with native-English-speaking students in word-level reading skills, such as decoding, but continue to lag behind in text-level skills, such as comprehension (August & Shanahan, 2006). Therefore, identification and implementation of English reading interventions is vital to support ELs' word- and text-level reading skill development. The mandate for schools and teachers is clear – effective instruction for all students includes a literacy program that accommodates ELs' needs.

Effective early intervention. Researchers and practitioners agree that early intervention is vital for all students who need extra support for reading acquisition (e.g., Cheung & Slavin, 2005; Connor, Morrison, & Katch, 2004). Selected early reading interventions demonstrate positive relationships with reading improvement for struggling readers. Interventions include those given in English like Reading Recovery (Ashdown & Simic, 2000; May et al., 2013), which is a pull out model for struggling readers, or the Interactive Strategies Approach (Vellutino & Scanlon, 2002), which focuses on classroom teacher instructional approaches.

Specific to ELLs, the same interventions are often used with positive effects, such as Reading

Recovery (e.g., Ashdown & Simic, 2000). Additionally, Descubriendo la Lectura, a Spanish

language version of Reading Recovery has shown positive results for ELs (Cheung & Slavin,

2005)*,* as well as bilingual intervention in two languages simultaneously with Literacy Squared (

Escamilla et al., 2010).

 According to findings from key research, components of the most effective intervention

for young children with low reading performance include: (a) explicit instruction in the

alphabetic principle and decoding while incorporating these processes with oral language and

reading or understanding (Baker et al., 2014); (b) a focus on reading intervention and prevention

in the early school grades(Lyon et al., 2001) ; and (c) intensive individual or small-group literacy

instruction (Baker et al., 2014). Additionally, comprehensive early reading intervention

programs that offer both *word-level* (e.g., decoding) and *text-level* (e.g., reading comprehension)

instruction may have the most sustained impacts on student reading achievement (e.g., May et

al., 2013; Vellutino & Scanlon, 2002).

 Two dissimilarities may highlight differences between ELs and their monolingual peers

who struggle with reading. First, ELs' English reading development is likely affected by their

English oral language development (e.g., Lesaux et al., 2010), which on average lags behind

their monolingual peers' development. Second, on average, ELs often make similar amounts of

progress to their monolingual peers, but because they generally begin with initial lower reading

achievement they subsequently remain behind their monolingual peers (e.g., August &

Shanahan, 2006; Fitzgerald, Amendum, & Guthrie, 2008).

 For ELs, word-level instruction and support from teachers often mirrors effective

instructional techniques used with monolingual students (August & Shanahan, 2006). Effective

word-level instruction typically involves systematic presentation of content and skills provided

through explicit instruction for monolingual students (NICHHD, 2000). These same types of

instructional strategies have been positively related to outcomes for ELs (e.g., Vaughn et al.,

2006), and, on average, lead to similar levels of achievement with monolingual peers (August &

Shanahan, 2006). Conversely, effective instruction in text-level skills such as comprehension is

more complex (Fletcher, 2006) and includes direct instruction in academic vocabulary and

integrating language and literacy instruction with content areas (Baker et al., 2014).

Additionally, intentional scaffolding of ELs' learning of text-based skill is vital, and utilizing

strategies such as questioning with a gradual release model can support ELs' participation on

classroom activities and language learning (Y. Kim, 2010).

Professional Development Intervention for Classroom Teachers

Given that ELs spend the majority of their school day in the general education classroom,

it is critical for their classroom teachers to possess the knowledge and skills needed to provide

them with effective instruction. Due to the challenges associated with children's reading

achievement in elementary school, classroom teacher quality has been the focus of a number of

descriptive studies and interventions in an attempt to improve the reading instruction of

classroom teachers (Garet et al., 2008; No Child Left Behind Act of 2001; Public Law 107-110,

2001; Risko et al., 2008; U. S. Department of Education, 2004). Studies investigating distal

characteristics of teacher quality (such as teacher qualifications, education, and experience) show

rather weak relationships to student reading achievement, especially for students at risk for

reading failure (Kainz & Vernon-Feagans, 2007). Therefore, most recently the development and

evaluation of professional development programs to improve teachers' reading instruction has

received attention. However, reviews have shown these professional development efforts to be

largely unsuccessful (e.g., Al Otaiba & Fuchs, 2006).

Findings from a key 2008 study (Garet et al.) demonstrated that teachers who received professional development had greater increases in reading knowledge and provided more explicit reading instruction compared to a control group, but there were no significant differences in student achievement between students with teachers in the treatment and control groups. Possible reasons for the lack of child reading differences may have been due to a lack of emphasis on important components crucial to successful professional development programs for classroom teachers: (a) supporting teachers to use diagnostic reading information to individualize instruction (i.e., instructional match; e.g., Scanlon et al., 2008); (b) setting the stage for teachers to "learn by doing" such that teachers learn effective pedagogical knowledge through successful teaching (Risko et al., 2008); (c) highlighting the need for teachers to use one-on-one teaching sessions every day with an individual child to help teachers improve their instructional practices and knowledge that help all children in their class (e.g., Massey, 2003; Speece et al., 2003); and (d) providing teachers with extended experience over an entire year or more so they can consolidate their improved reading practices in helping to prevent reading failure (Wayne, Yoon, Zhu, Cronen, & Garet, 2008).

Summary

The Targeted Reading Intervention has several key components that make it a potentially effective early reading intervention for young English learners. First, TRI has a successful record as an effective reading intervention for struggling readers in early elementary school (Amendum et al., 2011; Vernon-Feagans et al., 2010; Vernon-Feagans et al., 2012; Vernon-Feagans et al., 2013). Second, the TRI provides an instructional framework with the potential to develop ELs' word- and text-level skills (August & Shanahan, 2006). Third, since ELs spend the

majority of their day in the general education classroom, the TRI maximizes alignment between classroom and intervention instruction by having the classroom teacher deliver the intervention.

Method

Background, Design, and Participants

Data for the current study were drawn from a larger three-year randomized controlled trial (RCT) of the TRI. Below we first describe the broader three-year RCT study context and selection of participants. Then, in the next section we provide details related to the current study.

Context of the larger study. The broader study included ten rural schools from three high-poverty rural counties in the southeastern United States. Each school received Title I funding, with the percentage of students eligible for free or reduced-priced lunch ranging from 64% to 87%. All of the kindergarten and first grade classrooms in each school participated in the TRI RCT, which occurred across three academic years. Randomization occurred at the classroom level, with approximately half of the classrooms in each school randomized as TRI treatment classrooms and half as control classrooms. First grade teachers participated in Years 1 and 2 of the study and kindergarten teachers participated in Years 2 and 3 of the study. A limited amount of teacher turnover occurred, primarily during the summer, such that teachers were involved in either one or two years of grade-level participation. Thus, during the three years of the project, 119 teachers in 100 classrooms were involved in the broader study.

Participant selection. Students were selected to participate in the study based on their classification as a *struggling reader* or a *non-struggling reader* according to grade-appropriate screening subtests from AimsWeb (Shinn & Shinn, 2002) and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002). For kindergarten students, screening subtests included AimsWeb *Letter Sound Fluency* (LSF) and DIBELS *First Sound Fluency*

(FSF). For first grade students, screening subtests included DIBELS *Phoneme Segmentation Fluency* (PSF) and *Nonsense Word Fluency* (NWF). We used grade-level and fall time point Aimsweb/DIBELS benchmarks to categorize all students as being at *high risk*, *some risk*, or *low risk* for reading difficulties. Students from both the *high risk* and *low risk* groups were randomly ordered onto a list to receive additional assessment on two subtests, Letter-Word Identification and Word Attack, from the Woodcock Johnson Diagnostic Reading Battery, III (WJ; Woodcock, Mather, & Schank, 2004). Because of the developmental reading level of student participants (Chall, 1996), and the difficulty in measuring comprehension (Fletcher, 2006), only word-level assessments were used to identify struggling readers. To be selected as a *struggling reader* eligible for study participation, consented students whose screening subtest scores identified them as *high risk* were required to score below 35% on the grade percentile score for one or both WJ subtests. To be selected as a *non-struggling reader* eligible for study participation, consented students whose screening subtest scores identified them as *low risk* were required to have an average grade percentile score on both subtests greater than 50%, with neither subtest falling below 35%. For the full study sample ($N = 1108$), this process led to the selection of three struggling readers and three non-struggling readers within each classroom.

Context of the current study. Because of our interest in the effectiveness of the TRI for EL students, the current study included a subsample of ELs derived from the full sample in the broader study. EL status was based on information received from parent/caregiver respondents on a demographic questionnaire sent home at the beginning of school year with consent forms. Questionnaires and consent forms were available to families in both English and/or Spanish. ELs were required to meet one of the following criteria: (a) their first language was a language other than English and English was not spoken in the home, or (b) their first language was a language

other than English, and although English was spoken in the home, the family reported that the

student received ESL services at school and/or the family received a Spanish consent form.

These criteria led to the inclusion of a subsample of 108 ELs, 76 of whom were considered

struggling readers (*n* = 38 treatment, *n* = 38 control) and 32 of whom were considered *non-*

struggling readers (*n* = 13 treatment, *n* = 19 control). Of the current study's sample of 108 ELs,

70 were kindergarteners and 38 were first graders. Most ELs were Spanish speakers (*n* = 101,

93%), but other languages included Arabic (*n* = 1, 1%), Chinese (*n* = 1, 1%), Creole (*n* = 4, 4%),

and Greek (*n* = 1, 1%).

Forty-seven teachers (*n* = 24 treatment, *n* = 23 control) taught the 108 ELs. Given grade-

level teachers' participation in the study for one or two years, the number of ELs in their

classrooms ranged from 1 to 8. The teachers serving the subsample of ELs were all female and

over 80% White. The majority of teachers were certified in early elementary education but only

about a fifth of teachers had obtained master's degrees. Across treatment status, they averaged

between eight and nine years' teaching experience.

As in the broader study, to support similar instructional models across treatment and

control conditions, EL students did not receive TRI intervention in place of any normal

instruction. Students in both conditions continued to receive any classroom instruction as well as

supplemental instruction provided by schools (e.g., instruction from an ESL teacher), and only

ELs in treatment classrooms received TRI in addition to typical classroom and small group

supplemental instruction.

Intervention Description

The TRI uses webcam technology to help classroom teachers use specific strategies with

individual learners to prevent reading failure. From hundreds of miles away, literacy coaches

watch and talk with classroom teachers each week in live webcam sessions to help teachers use diagnostic literacy strategies to individualize instruction for low-performing struggling readers, who then progress rapidly in early reading. Teachers are asked to work individually with one struggling reader 15 minutes each day, 3-4 times/week until the child makes rapid progress in reading (typically ranging from six to 10 weeks), at which point teachers move to another selected struggling reader. Coaches provide immediate and real-time diagnostic feedback to help classroom teachers choose the best individualized instructional strategies for each student. One half-time literacy coach works with 12 to 15 teachers via webcam each week. Recent evidence from past TRI studies showed that webcam coaching produces better reading gains for struggling readers and greater gains in classroom teacher efficacy compared to face-to-face coaching (Vernon-Feagans, Bratsch-Hines, Varghese, Bean, & Hedrick, 2015). In a series of randomized controlled trials, the TRI produced effect sizes of .30 to .70 for struggling readers; additionally, non-struggling readers in TRI classrooms have also profited from the TRI, with effect sizes of .30 to .40, signifying that TRI teachers were able to generalize TRI practices to benefit all children in their classrooms (e.g., Amendum et al., 2011; Vernon-Feagans et al., 2013).

       TRI intervention and content. TRI literacy coaches meet weekly (later transitioning to biweekly) with individual teachers via webcam to observe teachers instructing a struggling reader. Coaches provide immediate feedback and scaffold teachers toward improved reading instruction. Using observation and diagnostic tools, coaches and teachers decide which strategies are most appropriate for an individual child. TRI teachers use a TRI Diagnostic Map (see Figure 1) to plan and chart the struggling reader's daily progress. Teachers are given TRI materials, including a white board, letter-sound tiles, picture dictionary, TRI Reference Tool, and books matched to progressively-challenging TRI instructional levels.

TRI instructional framework. Three instructional activities comprise each 15-minute TRI session: *Re-Reading for Fluency*, *Word Work*, and *Guided Oral Reading*. Although the strategies used are slightly different as children progress through four TRI levels (described fully in the subsequent section), the strategies build on each other in order for the child to reach fluent reading with beginning comprehension.

In *Re-Reading for Fluency*, the student re-reads part of a book that he or she has read at least once the previous day. The teacher might model or scaffold fluent expressive reading with some or all of the text, depending on the skill level of the child. *Re-Reading for Fluency* is primarily designed to build students' early reading fluency and automatic word recognition (LaBerge & Samuels, 1974).

In *Word Work*, the teacher uses several instructional strategies to help the child manipulate, say, and write words (cf. Bear, Invernizzi, Templeton, & Johnson, 2012; Moats, 1998; Morris, Tyner, & Perney, 2000), based on progress monitoring and the TRI Diagnostic Map. In addition, the teacher makes sure each word presented during the word identification strategies can be defined by the child and used in a sentence that demonstrates understanding of that word. If needed, direct vocabulary instruction is provided to students, with teachers using a TRI picture dictionary as needed. Along with the help of their literacy coach, the teacher makes decisions about when to progress to more challenging levels of word identification and adopt slightly different strategies. Thus, each teacher learns to assess the child's level of word identification and vocabulary skills and select a particular diagnostic strategy that is matched the skill level of the child in order to achieve instructional match (Connor et al., 2007; Connor et al., 2004). All TRI strategies help children define and use tier 1 and tier 2 vocabulary words (Beck, McKeown, & Kucan, 2002), demonstrate the alphabetic principle and phoneme-grapheme

13

(sound-symbol) relationships within words, develop students' segmenting and blending abilities (phonemic awareness tasks), and help students recognize sight words.

In the last of the three activities, teachers and students engage in *Guided Oral Reading* (GOR). Teachers choose a text at children's instructional reading level, as guided by *Word Work* strategies and the Diagnostic Map. Teachers pay particular attention to scaffolding children's abilities to define new words as well as summarize, predict, and make connections and inferences from the text they have read. Teachers provide beginning comprehension instruction for students in these selected comprehension strategies by modeling and providing guided practice for students within GOR. Direct vocabulary instruction is provided to students as needed with quick child-friendly definitions as needed (Beck & McKeown, 2001). We distinguish TRI GOR from contemporary guided reading in small-group classroom instruction in two ways: (1) TRI texts are more closely matched to the individual student's needs and (2) TRI teachers offer greater focus on word-level, moment-by-moment scaffolding, as well as a traditional focus on fluency and comprehension strategies. After each session, teachers return to the TRI Diagnostic Map to develop a plan for children's next session.

TRI instructional levels. The TRI has four instructional levels that become progressively more challenging in early reading: Pink, Blue, Green, and Purple. Each level helps children with fluency, decoding words in isolation and in texts, defining words and using them in sentences, as well as reading fiction and non-fiction texts that focus on the child summarizing and answering questions about what she/he has read. At each level students are encouraged to "do the work" and are allowed appropriate amounts of time to respond to the reading instructional activities; always referring to letter sounds within real words (not separate from words); and always making sure children "blend as they go" in segmenting and blending words so that fluency is optimized.

Students at the *Pink* level are beginning readers who are gaining knowledge of the alphabetic principle, striving to segment and blend words containing short vowels with two or three sounds, as well as needing practice in developing oral language vocabulary and text comprehension skills. Teachers assist in scaffolding students' ability to define words and use them in a sentence, manipulate the sounds within words by introducing segmenting and blending while also integrating phonics knowledge, early reading, and fluency practice. Guided Oral Reading ensures that students can summarize texts and answer concrete and abstract questions about the text they have read.

Students at the *Blue* level consistently show greater understanding of the alphabetic principle, have increasingly greater phonics knowledge, and are progressing in their segmenting and blending skills of words with short vowels by frequently demonstrating the ability to segment and blend sounds in words with four to six sounds. Teachers continue to scaffold students' ability to manipulate the sounds within words by introducing more sophisticated short-vowel words, such as words with complex initial and final consonant blends or digraphs, and focus on fluency, word identification, vocabulary development, oral language development, and comprehension. Comprehension instruction is limited to some degree by the texts students read at the Pink and Blue levels; often texts are simple decodable books with limited depth for comprehension instruction.

Students at the *Green* level understand the alphabetic principle, have stronger phonics knowledge, and are able to segment and blend sophisticated long-vowel words, define these words, and use the words in sentences. Students at the Green level are ready for more advanced phonics knowledge, including learning that the same long vowel sound may be represented by

15

different orthographic patterns. Teachers continue to use comprehension strategies such as prediction, summarizing, and retelling to support readers in their understanding of the text.

Students at the *Purple* level understand the alphabetic principle, are progressing in advanced phonics knowledge by demonstrating the ability to segment and blend one-syllable words containing diphthongs and/or long vowel patterns. Students at the Purple level are ready to learn how to recognize and chunk two-, three-, and four-syllable words flexibly and independently. They are ready to learn how to analyze the pattern of vowels and consonants in words to determine where to divide words into syllables. Reading practice at the Purple level continues to be presented in the contexts of reading real words or real texts and focuses on fluency, decoding multi-syllabic words, vocabulary development, oral language development, and comprehension.

TRI professional development and coach training. In the following section we describe the professional development process and associated activities for classroom teachers. Then, we describe the training process for TRI coaches.

Teacher professional development. TRI teacher professional development (PD) included five components: the TRI institute, the TRI website, weekly/biweekly webcam coaching sessions, team meetings, and ongoing professional development sessions. At the TRI Institute, TRI teachers and relevant school personnel (e.g., principals and reading specialists) attended a three-day training where they received TRI materials and learned diagnostic reading strategies aimed to help struggling readers. Teachers watched video examples and modeling by coaches, participated in role-play using TRI strategies, and practiced using strategies independently with children. A highly-interactive TRI website, introduced at the institute to

teachers for continued professional development, housed TRI content, including PDFs of strategies, TRI teaching tools, and videos of TRI teaching strategies.

During weekly/biweekly webcam coaching sessions, TRI coaches met individually with each classroom teacher to watch the session, provide individualized feedback, and answer questions and problem-solve with the teacher. At the beginning and ending of each coaching session, coaches and teachers communicated about the student's most pressing need and the TRI activities, strategies, level, and texts that would most effectively meet that need. Through ongoing modeling and support, the coach helped the teacher to reflect on and use student progress monitoring to determine the student's current level of decoding, vocabulary, and comprehension skills and to set goals to help the student progress in his or her skills at a rapid pace. As follow-up to each webcam coaching session, coaches emailed feedback and answers to teacher questions. The TRI coaching model emphasized building a relationship with the teacher and student over the webcam and providing a strong support system (Koh & Neuman, 2006). Over the course of teachers' year or two of TRI participation, coaches provided less scaffolding over time; thus, coaching sessions were designed to make teachers independent experts in teaching reading. Finally, during weekly (and eventually bi-weekly) team meetings, TRI coaches met with the school-based TRI teaching team via webcam for 30 minutes. TRI coaches also provided ongoing professional development, building on teachers' needs and enhancing teachers' TRI practices. Ongoing professional development sessions lasted from one to three hours and were facilitated by the coach via webcam.

Coach training. A total of six coaches worked with teachers across the course of the study. Five of the coaches were doctoral-level graduate students in education who had previous classroom teaching experience and one coach was a former classroom teacher and literacy coach.

Five of the coaches were female and one was male; five of the coaches were White and one was Asian American. All coaches spoke English with the teachers and EL students. All coaches held Master's degrees. While not all coaches held state certification as reading specialists the TRI purposefully identified and hired coaches who had extensive teaching experience and expertise in elementary literacy instruction. Additionally, all coaches participated in an intensive training process. Coaches were trained during the summer with a 5-day coaching institute, where they learned TRI content and strategies as well as coaching pedagogy. As part of the training, coaches submitted video recordings of themselves completing the TRI with early elementary students and received feedback from the intervention director until they were deemed proficient in delivering the intervention. Coaches attended weekly meetings throughout the school year to discuss any concerns as well as the content of ongoing teacher professional development. Coaches regularly met with the intervention director and/or master coaches to discuss coaching issues with individual teachers and coaching strategies to best promote high implementation fidelity.

Data Collection Procedures

At the beginning of each study year, all students who participated in the study returned consent forms from their parents or primary caregivers, which included consent to participate in the study and information about child and family demographic characteristics. In the fall and spring of each study year, teachers completed questionnaires about their professional background, classroom characteristics, and information specific to selected struggling and non-struggling readers.

All struggling and non-struggling ELs in the study were administered a limited battery of standardized tests in the fall and again in the spring of the school year. Prior to data collection,

TRI assessors, who were primarily graduate students or former teachers, took part in two eight-hour training sessions led by a TRI research coordinator in order to become a certified assessor for the project. Because of the remote location of the schools, the project aimed to hire assessors from target areas. Trainings with distance assessors were conducted on site and then followed up via online communication and video conferencing. Following the training sessions, assessors submitted video recordings of themselves completing the full battery of assessments with non-participating children. TRI's research coordinator scored and evaluated the video recordings to ensure reliability. Once deemed reliable, assessors visited the schools in the fall and spring to collect child assessment data. All child assessments were administered in a quiet area in the schools. All assessments were conducted in English, and assessors spoke English with children during assessments.

Measures

Treatment variable. As described above, teachers assigned to the TRI treatment were notified in early summer, invited to an intensive three-day summer institute, and provided ongoing weekly/biweekly webcam coaching and weekly team meetings for the academic year. Treatment teachers were also given TRI-related resources and access to the password-protected TRI website as well as a laptop to use for remote webcam-based coaching sessions. Teachers in control classrooms received a laptop or iPad and a computerized math curriculum (Building Blocks; Clements & Sarama, 2007) but did not receive TRI training, coaching, materials, or website access until the conclusion of the study.

Treatment and struggling reader status. Four groups of English learners participated in this study, as defined by treatment and struggling reader status: Treatment struggling (TS), control struggling (CS), treatment non-struggling (TNS), and control non-struggling (CNS). We

created a categorical dummy variable, *treatment status*, with four levels as our predictor of

interest to understand the effects of the intervention for ELs falling into these varying groups.

Outcome variables. Fall and spring standardized assessments were conducted using

three WJ subtests conducted in English (Woodcock et al., 2004): *Letter-Word Identification*,

Word Attack, and *Passage Comprehension*. For all subtests, CompuScore, provided from the

commercial test provider, was used to calculate *W* scores, which are Rasch ability scores

providing equal interval characteristics of measurement.

Letter-Word Identification measured the child's word identification skills. Initial items

required the child to identify letters that appeared in large type. Remaining items required the

child to pronounce words correctly, with items becoming increasingly difficult as the selected

words appear less frequently in written English. Letter-Word Identification has a median

reliability of .91 in the 5 to 19 age range (Woodcock et al., 2004).

Word Attack measured the child's skill in applying phonic and structural analysis skills to

the pronunciation of unfamiliar printed sounds and words. Initial items required the child to

produce sounds for single letters. Remaining items required the child to read aloud letter

combinations that were phonetically-consistent patterns in English orthography but were non-

words or low-frequency words, with items becoming progressively difficult. Word Attack has a

median reliability of .87 in the 5 to 19 age range (Woodcock et al., 2004).

Initial items from *Passage Comprehension* measured the child's symbolic learning and

required the child to match a rebus with an actual picture of an item. The more advanced items

employed a modified cloze procedure that required the child to read a short passage and provide

a missing key word, which made sense within the context of the passage. The items became

increasingly difficult by removing pictorial support and by increasing passage length and

difficulty as well as vocabulary complexity. Passage Comprehension has a median reliability of .83 in the 5 to 19 age range (Woodcock et al., 2004).

Moderating variable. In the fall and spring of each study year, research assistants assessed students selected as struggling and non-struggling readers with the Test of Language Development 4th Edition (TOLD; Newcomer & Hammill, 2008). TOLD provided an assessment of children's oral language and vocabulary knowledge. The TRI used the Oral Vocabulary subtest, which was a 38-item semantic subtest that measured the child's ability to give oral definitions for common English words that were spoken by the assessor without the use of pictures. Example items were *hat*, *chair*, *television*, and *cake*. Test-test reliability was 0.82 (Newcomer & Hammill, 2008). Scaled scores were used in analyses.

Control variables. Four variables were added as control variables: *fall performance, grade, child gender,* and *family socioeconomic status* (SES). Fall performance scores were ELs' fall WJ score on respective subtests. Grade was dummy-coded as 0 (kindergarten) and 1 (first grade). Child gender was dummy-coded as 0 (female) and 1 (male). SES was comprised of two variables reported by parent/caregiver respondents on the demographic questionnaire: family income and maternal education. Family income was coded as a categorical dummy variable with three levels of $20,000 increments, with 71.26% of families of ELs reporting incomes between $0 and $20,000. Maternal education was coded as a continuous variable representing the highest number of years of education of the mother/caregiver in the household ($M = 9.51$; $SD = 2.33$). To create the final variable of SES, family income and maternal education were transformed into *z*-scores and averaged.

Fidelity of Implementation

TRI developed a fidelity system to assess the degree to which treatment teachers implemented the TRI according to intervention design. The fidelity system captured struggling readers' exposure to TRI instructional sessions and teachers' exposure to TRI webcam coaching sessions; teachers' adherence to the structure of TRI lessons (e.g., teachers did what was expected); and teachers' quality of implementation (e.g., teachers performed intervention activities well; Nelson, Cordray, Hulleman, Darrow, & Sommer, 2012). For exposure fidelity, at each weekly team meeting, TRI teachers reported how many sessions they completed with a struggling reader over the course of the previous week and TRI coaches recorded the number of coaching sessions they completed with each treatment teacher over the course of the previous week. To capture adherence and quality of implementation, TRI developed a coded fidelity system in which trained research assistants coded videos of individual teacher-struggling EL TRI sessions. These sessions were observed live and video-recorded via remote webcam by TRI literacy coaches, and subsequently uploaded to a secure drive. Video sessions were typically 20 minutes in length, with the teacher and struggling reader participating in the TRI lesson during the first 15 minutes and the teacher and coach discussing the child's most pressing need and planning for the next lesson during the last 5 minutes. Two video sessions for each struggling reader were randomly selected to be coded for fidelity. In order to allow for variation in student and teacher familiarity with the TRI, the first video was randomly selected from one of the student's first three TRI sessions and the second video was randomly selected from one of the student's last three TRI sessions. Research assistants coded each of the teacher videos for adherence and quality fidelity using codes based on intervention elements. A minimum of 15% of videos were double-coded for reliability purposes.

Student exposure was measured as the number of weeks that each child received the TRI over the course of the year and the total number of TRI sessions. On average, ELs received the one-on-one TRI intervention for nine weeks and approximately 21 sessions per child. Teacher exposure was measured as the number of weeks that each teacher received coaching sessions per child and the total number of coaching sessions. Treatment teachers of EL students received an average of four TRI coaching sessions for each child with whom they worked. On the coded fidelity measure, teachers were coded as having 82% adherence to TRI strategies across sessions with their EL struggling readers. They were coded as providing high-quality scaffolding during 66% of the strategies, and using high-quality contextual clues for their struggling readers during 59% of the strategies.

Results

Method of Analysis

Based on our experimental design, we performed an intent-to-treat analysis comparing intervention effects for students of varying TRI treatment and struggling reader status. For treatment students, 0–15% of predictor data were missing and 0–8% of spring outcome data were missing. For control students, 0–11% of predictor data were missing and 0–3% of spring outcome data were missing. To avoid imprecise estimation of models due to these missing data, we created and analyzed multiple imputed datasets in SAS 9.2. Data for treatment versus control students were imputed separately and combined for analyses based on recommendations from What Works Clearinghouse (2013). Multiple imputation procedures used an iterative method to estimate the multivariate relations among study variables for cases with available data. These observed relations among study variables were then used to estimate plausible values for missing data (Graham, Olchowski, & Gilreath, 2007). Consequently, analyses were run on each of 20

imputed datasets. Model parameters were aggregated across the datasets using the

MIANALYZE procedure in SAS. All continuous predictors were centered prior to analyses.

Separate models were conducted for each outcome (Letter-Word Identification, Word

Attack, and Passage Comprehension), controlling for fall performance, grade, child gender, and

family SES. Because preliminary three-level hierarchical linear models (HLM; Raudenbush &

Bryk, 2002) accounting for students nested in classrooms and classrooms nested in schools

indicated non-significant variation between schools and between classrooms within schools, we

dropped level three (school) from subsequent analyses. Furthermore, although two-level models

yielded significant variation at level one (student) but not level two (classroom), we kept the

random effect for level two because classroom was the unit of randomization for the study.

Thus, our method of analysis involved fitting two-level HLM to account for the nesting of

children in classrooms. Based on one year of instruction, these models predicted ELs' reading

and literacy spring scores, controlling for fall scores. ANCOVA analyses were conducted using

the MIXED procedure in SAS.

Model 1 of ANCOVA analyses for the three outcomes included using planned

comparisons testing four effects of the intervention for ELs: (1) whether the TRI treatment led to

larger growth for treatment struggling ELs as compared to control struggling ELs (TS versus

CS); (2) whether the TRI treatment led to "catch up" effects for treatment struggling ELs as

compared to treatment non-struggling ELs (TS versus TNS); (3) whether not receiving the TRI

treatment led to lower growth rates for control struggling ELs as compared to control non-

struggling ELs (CS versus CNS); and (4) whether the TRI treatment led to teachers generalizing

improved reading instructional practices to benefit treatment non-struggling ELs as compared to

control non-struggling ELs (TNS versus CNS).

Model 2 of ANCOVA analyses for the three outcomes included testing moderation effects of EL students' fall oral vocabulary skills and their treatment and struggling status. Treatment effects and interactions were estimated using the same method as in Model 1. The estimates compared gains for treatment and control struggling and non-struggling students across levels of oral vocabulary skills.

For the continuous outcomes in the study, effect sizes for significant treatment effects using multilevel models were calculated Hedges' *g*, as guided by recommendations from What Works Clearinghouse (2013). Hedges' *g* is adjusted group mean differences divided by the unadjusted pooled within-group standard deviation of each outcome (What Works Clearinghouse, 2013, p. 20). As seen below, γ represented the HLM coefficient of the effect of the TRI, adjusting for the level-1 and level-2 covariates in the model. This effect size calculation also accounts for student sample sizes of the treatment (n_t) and control (n_c) groups as well as student-level standard deviations of the treatment (s_t) and control (s_c) groups, as depicted in the formula below.

$$g = \frac{\omega\gamma}{\sqrt{\dfrac{(n_t - 1)s^2_t + (n_c - 1)s^2_c}{n_t + n_c - 2}}}$$

Baseline Equivalence

Based on treatment and struggling reader status, we examined fall scores for oral vocabulary, Letter-Word Identification, Word Attack, and Passage Comprehension prior to HLM analyses. As expected based on study design, struggling readers across treatment and control status scored significantly lower than non-struggling readers on all fall tests. For treatment versus control non-struggling readers, no significant differences in fall scores existed. For

treatment versus control struggling readers, only Word Attack fall scores were significantly

higher, $M = 407.53$, $SD = 31.18$, $t(75) = 2.83$, $p = .03$.

HLM Results

HLM results for each of the three Woodcock Johnson subtests are presented in Table 2.

Each outcome is detailed further below.

Letter-Word Identification. In Model 1, treatment struggling ELs had significantly

higher spring Letter-Word Identification scores (conditioned on fall scores) than control

struggling ELs, gaining 11.71 points across the year ($p = .02$, $g = 0.43$). For this medium effect

size, the advantage for ELs in treatment classrooms was over one-third standard deviation in

observed spring scores ($SD = 29.29$). The remaining planned comparisons were not significant.

In Model 2, no evidence existed that the significant treatment effect for treatment versus control

struggling ELs was moderated by fall oral vocabulary skills ($B = 2.48$, $p = .10$).

Word Attack. In Model 1, treatment struggling ELs had significantly higher spring

Word Attack scores (conditioned on fall scores) than control struggling ELs, gaining 11.12

points across the year ($p = .04$, $g = 0.45$). For this medium effect size, the advantage for ELs in

treatment classrooms was over one-half standard deviation in observed spring scores ($SD =$

20.20). Furthermore, control struggling ELs performed significantly lower than control non-

struggling ELs ($B = -18.27$, $p = 0.01$, $g = -0.74$). This relationship was not significant for

treatment struggling ELs versus treatment non-struggling ELs ($B = -10.93$, $p = 0.18$). In Model

2, no evidence existed that the significant treatment effect for treatment versus control struggling

ELs was moderated by fall oral vocabulary skills ($B = 3.07$, $p = .08$).

Passage Comprehension. In Model 1, treatment status was not significant in predicting

to spring Passage Comprehension scores. Treatment struggling ELs performed significantly

lower than treatment non-struggling ELs (B = -16.23, p = 0.01, g = -0.48). In addition, control

struggling ELs performed significantly lower than control non-struggling ELs (B = -17.31, p =

0.001, g = -0.68). In Model 2, no evidence existed that the significant treatment effect for

treatment versus control struggling ELs was moderated by fall oral vocabulary skills (B = -0.26,

p = .87).

Main Conclusions & Discussion

Main Conclusions

The main findings from this study supported the effectiveness of the TRI for young

English learners. Based on the results of the HLM analysis and the research questions, we drew

four main conclusions. First, struggling ELs in TRI classrooms significantly outperformed

struggling ELs in control classrooms on two spring reading outcomes. Specifically, struggling

ELs from TRI classrooms ended the year with significantly higher Letter-Word Identification

and Word Attack scores. Effect sizes were .43 and .45, representing close to one-half standard

deviation advantage for struggling ELs from TRI classrooms on the two significant outcomes.

However, struggling ELs in TRI classrooms did not outperform struggling ELs in control

classrooms on Passage Comprehension. Second, struggling ELs in TRI classrooms were not

able to close the performance gap with their non-struggling EL peers. Third, in control

classrooms, on average, struggling ELs had slower growth rates compared with their non-

struggling peers' rates. Finally, for the significant intervention effects for Letter-Word

Identification and Word Attack favoring TRI struggling ELs, there was no evidence that effects

were moderated by ELs' fall oral vocabulary skills.

Discussion

The efficacy of the TRI for ELs in the primary grades was supported because struggling

ELs in TRI classrooms significantly outperformed struggling ELs in control classrooms. The

results suggest that the TRI is an effective intervention to address young ELs' early reading skills

(August & Shanahan, 2006; Baker et al., 2014), and that within TRI instruction the teacher-child

interactions, or proximal processes (Bronfenbrenner & Evans, 2000), were supportive of

effective teaching and learning for ELs. However, prior to the discussion below, we also note

the difficulty of identifying ELs who are struggling readers; often the designation of "struggling"

status may be related to students' proficiency with English rather than true difficulty with

reading acquisition, often resulting in inappropriate placements in special education (Copeland et

al., 2006; Sullivan, 2011). Below, further discussion related to each of the main conclusions is

provided.

The significant advantage for struggling ELs from TRI classrooms over those from

control classrooms for word-level skills is likely due to the systematic word work instruction

included in the TRI instructional framework, as well as the opportunities for students to apply

word-level instruction during the Guided Oral Reading portion of the TRI intervention lesson.

This type of systematic word-level instruction is vital for beginning readers (Ehri, 1991; Vernon-

Feagans et al., 2013), and reflects the key developmental reading skills for students in the

primary grades (Chall, 1996). In addition, guided by the TRI instructional framework, teachers

in the intervention were likely able to align TRI word work instruction to diagnostic information

about each child, a hallmark of effective professional development interventions with classroom

teachers (e.g., Connor et al., 2004; Vellutino & Scanlon, 2002). By providing instruction

matched to ELs' early reading skills, the interactions within TRI instruction were likely more

effective for those students' early learning (cf. Bronfenbrenner & Evans, 2000).

Researchers have described the importance of providing instruction and intervention to

ELs that addresses both word-level and text-level skills (August & Shanahan, 2006; Francis et al., 2006; Silverman, 2007), and the TRI was designed to address both. In prior studies comparing struggling students in TRI classrooms with those from control classrooms, the TRI had significant positive impacts on both word- and text-level outcomes (e.g., Amendum et al., 2011). But, in the current study, significant advantages for ELs from TRI classrooms were only found for word-level skills (Letter-Word Identification and Word Attack) and not for text-level skills (Passage Comprehension).

Several potential explanations exist for the lack of a significant passage comprehension effect. First, because of the small sample sizes within planned comparisons, there may not have been power to detect a significant difference. Given the noteworthy differences in the spring Passage Comprehension w-score gains between struggling ELs in TRI and control classrooms (25.63 vs. 17.51, respectively), an underpowered comparison may have led to the non-significant result. Second, non-significance of Passage Comprehension could be related to EL students' reading development. Students in the primary grades are often in the emergent stages of reading development in which word-level skills like phonemic awareness and beginning word recognition are of primary importance (Chall, 1996; Fitzgerald & Shanahan, 2000). Thus, it may be that differences between ELs in TRI and control classrooms were centered on the particular word-level skills commonly developed during an early developmental period. Third, the lack of Passage Comprehension effect could be due to students' EL status. It could be that comprehension gains for this group are related to some first-language skills and knowledge, or conversely, that specific adaptations based on effective interventions (e.g., Escamilla, 1994; Escamilla et al., 2010) of the comprehension strategies are needed for ELs. Fourth, it could be that teachers were more skilled at delivering different parts of the intervention. Perhaps teachers

29

felt more comfortable with the word work, and were more effective at delivering the intervention for students earlier in their reading development who needed a major emphasis on word recognition instruction. Conversely, teachers may have been and less comfortable with the vocabulary and comprehension instruction, particularly when working with ELs, a population absent from many teachers' preparation or professional development programs (e.g., Ballantyne, Sanderman, & Levy, 2008). Finally, the possibility exists that the TRI did not have any true effect on struggling ELs' comprehension when compared with struggling ELs in control classrooms, and that the differences in the spring means were random.

The analyses also showed that struggling ELs in TRI classrooms were not able to make statistically significant gains relative to non-struggling ELs in their classrooms and thus catch up to their non-struggling EL peers. One explanation for this non-significant effect is likely due to students' status as English learners. One might surmise that non-struggling ELs are further along in their English language development, and we know that young ELs are often simultaneously learning English as well as acquiring new content and skills (Calderón, 2007; Coltrane, 2003). Thus, for the struggling ELs, similar to the argument LaBerge and Samuels (1974) make for decoding and comprehension, it may be that the bulk of their cognitive resources are devoted to the language demands rather than the reading skill demands within a lesson. Conversely, non-struggling ELs who may have more developed English language skills may be able to devote more cognitive resources to the reading skill demands within a lesson. At the same time, researchers have theorized that ELs need multiple years to acquire academic English (e.g., Collier, 1987; Cummins, 1984). Combined, these two ideas illustrate the potential difficulty for struggling ELs to catch up to their non-struggling peers within a *single* school year, and that additional time may be necessary for struggling ELs to match their non-struggling peers'

achievement.

A second possible explanation may be related to the nature of the intervention. The TRI was not a yearlong intervention; on average, struggling ELs received approximately nine weeks of TRI instruction. The typical nine-week length of intervention suggests that the significant learning effect, but lack of "catch up," are not surprising. Additionally, struggling ELs' limited success in catching up to non-struggling ELs could hypothetically be related to the lack of comprehension progress made during the intervention period and across the year. Word- and text-level processes are reciprocal; additional wide reading with comprehension supports continued development of students' fluent word recognition skills (Pikulski & Chard, 2005). Such a hypothesis may have important implications for TRI development. New TRI intervention components that focus on comprehension and oral language development may be warranted for ELs in order to support comprehension, as well as fluent word recognition.

A final, and alternative explanation, for the lack of "catch up" effect is potentially related to the nature of the intervention itself and whether the impacts of the intervention are robust across the typical development of early reading. For example, it may be that the TRI is well suited to moving students from point A (basic alphabet knowledge of letters and sounds) to point B (fluent decoding of 3-5 sound regularly spelled words) within books with controlled vocabulary (i.e., limited unique words). However, it may be that because the primary focus of the TRI is not on building oral language, that it may be less suited to moving students from point B to point C where a broader knowledge of vocabulary and oral language knowledge is required to support comprehension. In such a situation, it is likely that the nine-week intervention periods is insufficient to support ELs' "catch-up" to their non-struggling peers.

Given that classroom teachers dedicated instructional time to a single struggling EL for

daily TRI implementation, teachers and administrators are often concerned that other non-struggling students' achievement will suffer (Amendum, 2014). Accordingly, a comparison of the non-struggling ELs in TRI classrooms versus non-struggling ELs in control classrooms provides an interesting view of this concern. Results from the analysis showed no significant effect in a negative direction for non-struggling ELs, indicating that in addition to the advantage for struggling ELs in TRI classrooms, non-struggling ELs were not disadvantaged in TRI classrooms, where teachers spent 15 minutes per day providing TRI intervention. In fact, (although statistically non-significant for the word-level outcomes), an examination of the means shows slightly higher means for all three reading outcomes for non-struggling ELs in TRI classrooms than for those in control classrooms (differences of 6.92, 7.43, and 4.24 *w*-score points for Letter-Word Identification, Word Attack, and Passage Comprehension, respectively).

Finally, analyses showed no evidence of moderation by students' fall oral vocabulary skills. This non-significant result indicates the efficacy of the TRI for ELs with varying levels of English vocabulary comprehension, an important finding because researchers have demonstrated differential growth of English reading for ELs based on English language abilities (e.g., Fitzgerald et al., 2015).

Limitations & Future Research

One limitation of the current study is the relatively small sample. With analyses that require comparisons among four groups of ELs (TRI struggling, TRI non-struggling, control struggling, control non-struggling) it is possible that power is compromised with 108 participants. Future research should attempt to replicate the findings from the current study with larger samples of English learners to detect differences that may not have been demonstrable with the current sample size.

A second potential limitation is the measures used in the study. No measures of native language proficiency were included for students in the study. Future research studies could include measures of native language proficiency to see the effect, if any, on English reading outcomes. Also, additional screening measures to identify struggling ELs should also be employed in future studies, including measures of fluency and comprehension in addition to word-level skills.

Third, the current study may have limited generalizability because the majority of ELs were native Spanish speakers, and teachers were relatively homogeneous demographically. Future studies should include a more diverse sample of both ELs and teachers.

Fourth, in this study, baseline equivalence was established for non-struggling readers. However, struggling readers in treatment versus control classrooms had significantly higher fall Word Attack scores, but not oral vocabulary, Letter-Word Identification, or Passage Comprehension scores. In analytic models, we conditioned outcomes based on fall scores both to allow for this difference and to estimate the growth made by treatment versus struggling ELs over the course of their year-long participation in the study. Nonetheless, there is a chance that treatment children with higher fall scores may have experienced larger growth due to their entry-level skills, and likewise, students with lower fall scores may have experienced less growth. While a future study with baseline equivalence would be ideal, additional studies which examine potential relationships between intervention effects and students' initial reading scores and growth would benefit the field.

Finally, as highlighted by the significant word-level effects in the current study, there is a possibility that inadequate emphasis was provided for English learners within both the initial student screenings and the TRI instructional framework on text-level skills, such as

comprehension and vocabulary. Future research should include a sample of students who were initially screened for both word-level skills and text-level skills (e.g., comprehension). Additional studies could also compare the effects of a modified version of the TRI, which more heavily emphasizes oral language and comprehension skills as part of the instructional framework, with the current instructional framework to consider possible enhanced effects for student reading outcomes.

Closing

In summary, results from the current study provide initial evidence of the efficacy of the TRI for young English learners' reading development. Specifically, struggling English learners in TRI classrooms significantly outperformed struggling English learners in control classrooms on selected measures of reading. While the results of the current study are encouraging, there is additional work to do in supporting English learners in their development to becoming fully proficient in English reading.

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Appendix

Targeted Reading Intervention Individual Teacher-Student Session with Webcam Coaching

Context: English-language learner's first TRI session with the coach watching. (All names are pseudonyms).

00:00-00:40: Beginning of TRI coaching session; teacher (T), Keshia, and coach (C), Sheri, have short discussion:

> C: I am Sheri [coach introduces herself to student].

> T: Michel and I, we only got started but we are going to start back over and today, I chose words from Pink 4E.

> C: OK.

> T: Michel and I have been working with the *th*, *sh*, and *ch*, so we are just going to go on with our lesson and then after that we can talk.

> C: Sounds great.

> T: Alright, Michel, let's regroup and start back over. OK? Ummm, let's see. Have you been having a good day [teacher asks coach]?

> C: I have. Have you?

> T: Good.

00:40-01:53: Teacher prepares *Change One Sound* activity

01:53-02:33: Student changes *chip* to *chop*

02:34-03:10: Student changes *chop* to *chap*

03:11-03:45: Student changes *chap* to *chat*

03:46-04:12: Teacher defines the word chat and prepares the *Read, Write, and Say* activity at the same time.

4:12-4:49: Student reads, writes, and says *that*

4:50-4:56: Teacher writes *mat*

4:57-5:27: Student reads, writes, and says *mat*

5:28-5:41: Teacher writes *mash*

5:42-6:29: Student reads, writes, and says *mash*

6:30-6:39: Teacher defines *mash*

6:40-8:12: Student begins *Re-Reading for Fluency* activity [note: activity is out of order; *Re-Reading for Fluency* usually occurs at beginning of lesson]

8:12-9:09: Teacher defines *path* and *bath*

9:21-9:25: Teacher prepares *Guided Oral Reading* activity (same book as *Re-Reading for Fluency*, reading pages the student had not read previously)

9:25-9:32: Teacher defines *moth*

9:33-11:31: Student starts reading

11:32-11:41: Teacher defines *thin*

11:42-12:37: Student continues reading

12:38-12:54: Teacher defines *worth*

12:55-13:22: Student finishes *Guided Oral Reading*

13:22-14:53: Teacher does non-TRI activity with student

14:54-15:07: Teacher reviews the word *path* she introduced to the student during the book reading

15:08-15:25: Coach talks with the student:

C: Michel, I am so proud of you! You are such a good reader! Wow! I am impressed! Good job, Michel!

15:45-20:30: Teacher and coach debrief session:

T: Alright, what you think, Sheri?

C: Wow! He looks great!

T: When I started working with him, I said "Oh, OK. OK." And you know he speaks Creole.

C: Right.

T: You noticed that I wasn't concerned about the fluency because he's got to translate both languages so that's why, you know, he needs thinking time to process what he's asked to do.

C: Sure.

T: Let me hear from you.

C: Well, right of the bat, I was very impressed. I mean, you didn't give him anything that was too, too challenging. He came to the word *thin* and I was holding my breath and he got through that. He didn't even know what the word *thin* meant but he could read it. So his decoding, his blending is great. I mean, he is really good. You did an excellent job throughout the whole lesson with vocabulary. So if I had to pick a video to show someone how to use with a student with ESL, I can go to this video right now and I can tell someone, "Do you see how this teacher embeds the vocabulary as she goes?" Because he did not know what a *path* was, so you talked to him about what a *path* was. He did know *bath* but you talked to him about a lot of different words: *thin*, *worth*. You embedded the word *moth*, which I thought was really, really smart. You previewed your book. You knew what it was about. You knew he didn't know what a *moth* was. You taught him really quickly, "This is a moth. It's like a butterfly." Go. You didn't spend a lot of time on it. Perfect. I mean I can't tell you how great that was. It was great. You know what I am going to say next. He needs to be in Blue. [Laughing].

T: Well, you know I have been skipping around and skipping around and, um…. Yeah, I am in agreement with that but I want him to get a little confident…

C: Right.

T: …with what he's doing. Now we worked with *th* and *sh*, we worked with those words the last two days and so you know we had to do a little bit to get where we are and every day in working one-on-one with him gets better and better.

C: Right.

T: And I have been looking at Blue, throwing some in, but I want him to feel very confident.

C: What I am going to tell you, though, is that Pink 4 is not very different at all from Blue 1 because you have the same sounds. You are just going from 3 to 4 sounds and he is ready for that.

T: Ok.

C: We want to challenge him just a little bit more. Try it and let me know how it goes. I'll see it tomorrow actually. Let's try to do a Blue 1 tomorrow.

T: No, the students won't be back until Tuesday.

C: Ah that's right. So I am glad we got this in.

T: So you want me to go to…. Oh yeah, are you talking about Blue 1A?

C: Yes.

T: Those words will not be a problem and I have thrown some in there at him. But in getting the book to coincide with the words is a little challenging. But he will not have a problem with making the words.

C: So you know that you can go to the back of the Blue 1 list and it will tell you *Egg Legs*, *Elk Yelps* [names of books]? It tells you some books to use.

T: Oh yeah. I am gonna pull out those books.

C: OK, great. He looks fantastic! I mean, you had a perfect lesson today. I could easily use this for training. It looked great! Thank you so much.

T: You are welcome.

C: I appreciate it. How is your dad?

T: Today is a bad day. Yesterday was a good day.

C: Oh good. Very good.

T: It was a good day. But one thing I wanted to say about Michel is that he is a good student and working with him, with good modeling, modeling, he catches on easily.

C: Right.

T: He is a good learner. So with modeling and repetition, he is going to do very well.

C: This one-on-one too is going to be invaluable for him because he has you right there. And you are giving him so much vocabulary. And that's really what he needs because English is his second language. So you are doing a great job! I think you really going to see him fly. I am excited that you are working with him.

T: Yeah.

C: Thanks, Keshia.

T: You are welcome.

C: Have a good long weekend.

T: Alright. You too. We'll be in touch!

C: Ok. Bye bye.

T: Bye bye.

Table 1

Descriptive Information for TRI Treatment (*Struggling,* N = 38; *Non-Struggling,* N = 13) *and Control* (*Struggling,* N = 38; *Non-Struggling,* N = 19) *ELs*

		Treatment							
	Struggling					Non-Struggling			
	N	% or *M*	*SD*	Range		N	% or *M*	*SD*	Range	
Grade (% first grade)	38	0.55	0.50	0.00	1.00	13	0.46	0.52	0.00	1.00
Child gender (% male)	38	0.42	0.50	0.00	1.00	13	0.46	0.52	0.00	1.00
Family SES	37	-0.04	0.66	-0.65	1.59	12	-0.16	0.59	-0.65	1.16
Oral vocabulary, fall (TOLD)	38	4.21	2.70	1.00	13.00	13	6.61	2.06	2.00	10.00
Letter-Word Identification, fall	38	356.05	40.17	283.00	413.00	13	399.46	24.13	367.00	439.00
Letter-Word Identification, spring	35	412.63	29.29	357.00	464.00	13	433.08	13.95	417.00	468.00
Word Attack, fall	38	407.53	31.18	369.00	465.00	13	444.69	22.55	422.00	473.00
Word Attack, spring	35	455.40	20.20	422.00	496.00	13	474.69	10.36	461.00	496.00
Passage Comprehension, fall	37	405.46	21.62	360.00	443.00	13	427.08	20.71	393.00	458.00
Passage Comprehension, spring	35	431.09	31.00	370.00	517.00	13	448.77	16.08	422.00	472.00
		Control							
	Struggling					Non-Struggling			
	N	% or *M*	*SD*	Range		N	% or *M*	*SD*	Range	
Grade (% first grade)	38	0.16	0.37	0.00	1.00	19	0.26	0.45	0.00	1.00
Child gender (% male)	38	0.42	0.50	0.00	1.00	19	0.26	0.45	0.00	1.00
Family SES	37	-0.08	0.73	-0.65	2.31	17	0.16	1.03	-0.62	3.31
Oral vocabulary, fall (TOLD)	37	3.38	2.64	1.00	10.00	19	6.11	2.33	1.00	9.00
Letter-Word Identification, fall	38	342.71	32.96	300.00	428.00	19	386.05	17.76	362.00	417.00
Letter-Word Identification, spring	37	392.30	25.57	339.00	446.00	19	426.16	17.49	401.00	468.00
Word Attack, fall	38	392.95	29.13	369.00	465.00	19	434.89	21.89	394.00	469.00
Word Attack, spring	37	436.92	28.31	378.00	505.00	19	467.26	13.77	422.00	487.00
Passage Comprehension, fall	37	402.03	12.80	370.00	427.00	19	421.53	19.13	393.00	458.00
Passage Comprehension, spring	37	419.54	18.02	393.00	465.00	19	444.53	15.97	422.00	482.00

Note. SES = Socioeconomic status. TOLD = Test of Language Development.

Table 2

Results from Multilevel Models Predicting to Woodcock Johnson Subtests

	Letter-Word Identification		Word Attack		Passage Comprehension	
Variables	*B*	*SE*	*B*	*SE*	*B*	*SE*
Model 1, main effects and planned comparisons						
Fall performance	0.59***	0.09	0.22	0.13	0.22*	0.11
Grade (% first grade)	-1.50	6.36	6.48	7.72	30.51***	5.09
Child gender (% male)	2.21	3.55	-1.33	4.04	-3.75	3.41
Family SES	2.87	2.43	-1.66	2.68	3.45	2.32
Oral vocabulary, fall (TOLD)	-0.43	0.76	0.89	0.92	0.16	0.74
Planned comparisons						
TS versus CS	11.71**	4.52	11.12*	5.29	-2.49	4.89
TS versus TNS	2.38	7.07	-10.93	8.17	-16.23*	6.35
CS versus CNS	-8.43	6.00	-18.27*	7.32	-17.31***	5.26
TNS versus CNS	0.90	6.32	3.78	7.52	-3.56	6.68
Model 2, moderation analyses						
Oral vocabulary*CNS	2.82	2.11	2.38	2.33	-0.30	2.02
Oral vocabulary*CS	2.48	1.51	3.07	1.77	-0.26	1.59
Oral vocabulary*TNS	1.11	2.67	-1.67	3.00	0.47	2.61
Variance Components						
Level Two	15.84	43.86	32.95	40.47	49.73	41.37
Residual	275.13***	55.35	362.29***	60.39	248.22***	45.15

Note: $^*p < .05.$ $^{**}p < .01.$ $^{***}p < .001.$ TOLD = Test of Language Development. TS = Treatment struggling. CS = Control struggling. TNS = Treatment non-struggling. CNS = Control non-struggling

Student: ___Samantha Sanchez___ Date: _9/9/2014_____ **PINK**

Student's Most Pressing Need: ___Blending 3 sounds___

Today's Plan	Assessment of Work	Notes for Next Time

Re-Reading for Fluency

Text Read: *Fox Hops*	Types of Errors: *None*	Re-Read same text ✗ Move to next text

Word Work

Segmenting Words

PINK words: *Skip*	Able to segment 3 sound words? ✗ Yes No Frequent phonics errors:	Repeat segmenting with 3 sound words Begin segmenting with 4 sound words Repeat sound _____ Move to new sound _____ ✗ Move to another activity

Change One Sound

PINK words: *Pink 3a:* *bed, bet, get, got*	Able to manipulate sounds in 3 sound words? ✗ Yes No Frequent phonics errors: *None*	Repeat changing with 3 sound words ✗ Begin changing with 4 sound words Repeat sounds _____ Move to another activity

Read Write & Say

PINK words: *Pink 3a, 3b:* *pit, pet, met, mess*	Able to blend 3 sound words? ✗ Yes No Frequent phonics errors:	Model "Blending As You Go" Repeat blending with 3 sound words ✗ Begin blending with 4 sound words Repeat sounds _____ Move to new sounds _____ *Try Blue 1* Move to another activity *tomorrow*

Pocket Phrases (comes after Guided Oral Reading)

Review Phrases: *on top of*
 	
 New Phrases: *get in bed*
	Is reading automatic?
	   Yes
	 ✗ No *in, of*
		✗ Repeat phrase __*get in bed*__
		   New phrase _____
		 ✗ Target words __*in, of*_____

Guided Oral Reading

Text Read:	Types of Errors:
	 (consider both areas)
	   Word Recognition
	   Comprehension
		Select an easier text
		 Choose another text at the
		   same level
		 ✗ Choose a higher level text

Extensions

✗ For Decoding/Phonics Knowledge _*Daily 5 Word Work – short vowels*_

✗ For Fluency/Sight Word Development _*Read to TA, pocket phrases*_

  For Comprehension _____

  For Vocabulary _____

  For Motivation _____