

Does Evidence-Based Reading Instruction have a Positive Impact on Struggling Readers?

This Missouri Research Study Addresses the Effectiveness of Evidence-Based Reading Instruction for Students who may be At - risk for Dyslexia

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Previous articles on dyslexia and Evidence-Based Reading Instruction by Terry and Dennis Clinefelter in *The Missouri Elementary Principal*:

(December 2016) “I Feel Like I am not Normal ...” Understanding the Dyslexic Students

(February 2017) Dyslexia - Testing, Prevention, and Intervention

(February 2018) Evidence-Based Reading Instruction (EBRI): Essential Elements for Students At Risk for Dyslexia

INTRODUCTION

This study, conducted by researchers at Northwest Missouri State University, involved Tier 1 instruction effects on approximately 200 Missouri early (K-2) elementary school students in 13 schools who scored at the 30th percentile or below on pre-tests measuring phonemic awareness, decoding, and recognition of sight words. National Reading Panel results from 2000 indicated the need to emphasize more time, smaller groups, and practice in the areas of phonemic awareness and phonics to teach decoding of words and fluency mixed with instruction of vocabulary and comprehension. This study provides evidence for this theory of Tier 1 reading instruction.

As noted in previous articles in the Missouri Elementary Principal, Missouri passed a recent legislative initiative to require screening for dyslexia and training for teachers about dyslexia. As noted by Shapiro (2014) in the RTI Action Network, high-quality Tier 1 instruction should reach 75-80 percent of students; the tier that encompasses the most students is Tier 1 (Buffman, Mattos, & Weber, 2009). This is often a balancing act when making decisions about students at risk for dyslexia who may need direct, explicit, structured literacy instruction in order to meet their needs as many schools use a balanced literacy model (Farnan & Christensen, 2017). This study explores the effect size of an Evidence-Based Reading Instruction (EBRI) on struggling readers.

The state of the art in reading remediation is prevention and early intervention (Foorman, 2008). As noted in previous articles, important elements for intervention for students at risk for dyslexia are “explicit and systematic instruction of phonemic awareness, phonics with application to reading and comprehending in text” (Clinefelter & Clinefelter, 2016, p. 39). Dyslexia is defined as a neurologically based deficit in the phonological component of language resulting in poor spelling and decoding abilities (IRA, 2002). Beginning with a focus on phonemic awareness, there are three levels of development in phonemic awareness:

- **Early – rhyming, alliteration, beginning sounds**
- **Basic – segmenting and blending words**
- **Advanced – manipulation of sounds by omitting and substituting words.**

Clinefelter & Clinefelter (2017, February) noted, “Early intervention focused on phonemic awareness simulation, phonics instruction, multisensory experiences, and a gradual release of responsibility of reading in context is essential. There then needs to be equal importance on decoding and oral language (listening comprehension)” (p. 51). The previous articles referenced the opinions of well-known researchers on dyslexia. Dr. Sally Shaywitz in her 2003 book *Overcoming Dyslexia*, writes regarding the use of fMRI technology to study dyslexia, “Seeing these images leaves no doubt that the core problem in dyslexia is phonologic: turning print into sound” (p. 87). Joseph Torgesen, Researcher at the Florida Center for Reading Research states, “We now have a very broad scientific consensus about the types of knowledge and skill that are required to become a good reader” (McCardle & Chhabra, 2004).

With the new legislation, national and state accountability, and a desire to meet the needs of all students (especially struggling readers), school districts are taking a closer look at students at risk as being classified as dyslexic. This process includes understanding the needs of the students, screening/assessment, prevention, intervention, and most importantly, providing students with EBRI that include the essential elements of reading.

In order to identify and serve students at risk for dyslexia or related disorders in accordance with the provisions of Section 167.950, RSMo. the Department of Elementary Education (DESE) provided a guidance document. Within that document, DESE describes screening as an “initial brief assessment that focuses on critical reading skills strongly predictive of future reading growth and development” (DESE Guidance, 2018). Most screenings used by schools – AIMSWeb and DIBELS – for example, do measure the blending and segmenting of the basic level, but do not address the advanced skill of manipulating sounds (Clinefelter & Clinefelter, 2017). In the article, “Dyslexia - Testing, Prevention, and Intervention” (February 2017) there was a comparison of Comprehensive Test of Phonological Processing-2 (CTOPP-2) with The Phonological Awareness Screening Test (PAST) for advantages and disadvantages of each screening instrument. This also outlined the additional assessment of phonemic awareness with The Test of Word Reading Efficiency (TOWRE) showing that low ability to sound out nonsense words accompany low phonemic awareness scores.

After identification of struggling readers’ needs, it is important to identify EBRI to increase a student’s reading through instruction and intervention. The February 2018 article, “Evidence-Based Reading Instruction (EBRI): Essential Elements for Students at Risk for Dyslexia” charted a comparison between two approaches, EBRI and Literacy-Based Instruction. This article highlighted some key points for schools to consider such as having students remember words by sight is easy at first but not sustainable as a student reaches high-grade levels. This review of the Missouri legislative initiative and guidance, the process for identifying struggling readers as at risk for dyslexia through screening, and the need for EBRI lead up to this research study which involved Tier 1 instruction effects on students who scored at the 30th percentile or below on pre-tests measuring phonemic awareness, decoding, and recognition of sight words (three tests common in the diagnoses of dyslexia).

DESCRIPTION OF EBRI USED IN THE STUDY

The commercially purchased EBRI program provided teacher professional development and a structured, multisensory curriculum to teach the research-based foundational reading skills in grades K-2. The foundational skills include:

the development of phonemic awareness to the advanced level (manipulation of sounds), systematic and explicit phonics instruction applied to single and multi-syllable word levels, *and*

the explicit transfer of these skills to reading single words, spelling, writing, and reading in context.

“Students used multisensory experiences that include articulation of sounds, manipulation of letters and shadow writing. Teachers provided immediate feedback on student errors following the program’s model of questioning which required students to verbalize their thinking and self-correct to become independent decoders and thinkers.

Large group instruction was followed by differentiated small group instruction based on the program’s quarterly student assessments. Fluency was strengthened through ensuring an advanced level of phonemic awareness, phonics knowledge, reading practice and sight word acquisition. Systematic reading in context allowed students to apply learned skills and use visual imagery and questioning to demonstrate comprehension of text” (T. Clinefelter, personal communication, June 5, 2018).

PURPOSE OF THE STUDY

This research investigated what level of success this type of EBRI had with struggling readers. In its simplest form, EBRI means a particular program or collection of instructional practices has a record of success. That is, “there is reliable, trustworthy, and valid evidence to suggest that when the program is used with a particular group of children, the children can be expected to make adequate gains in reading achievement” (International Reading Association, 2002). EBRI provides data to show evidence for the success or failure for this type of instruction. This study utilized the three levels of success defined by Kilpatrick (2015) as minimal, moderate, and successful (see Table 1 on p ____).

METHODOLOGY

“Standard score point gains on nationally normed tests appear to be the best way to determine if an intervention has helped weak readers narrow or even close the gap with their typically developing peers” (Kilpatrick, 2015, p. 292).

SUBJECTS USED IN THE STUDY

Data collection occurred during the 2016-2017 school year with approximately 200 early elementary students in 13 schools in Missouri, pre and post Tier 1 instruction using a model based on the attributes described by the National Reading Panel. Results were evaluated to determine the effect of Tier 1 instruction on students who scored at the 30th percentile or below on pre-tests measuring phonemic awareness, decoding, and recognition of sight words. "Because one quarter to one-third of students struggle in reading to some degree any scores in the bottom third of the distribution should receive further attention" (Kilpatrick, 2015, pg. 153). These students demonstrated they were in the at-risk range for reading difficulties and dyslexia.

Since EBRI should have an impact on the phonemic awareness and decoding ability in students, the study used assessments that measured the skills of manipulating sounds and sight-reading of words. The study used the CTOPP-2 Elision test for measuring phonological ability and the TOWRE test to measure a student’s efficiency in phonemic decoding and recognition of sight words. This study used Kilpatrick’s evaluation of successful reading instruction to discover the level of success of the program studied. The researchers evaluated the effect size of the program by using scaled scores on the pre- and post-test results on the CTOPP-2 and TOWRE. Using descriptive statistics from each pre- and post-test, the researchers calculated the difference in means between the pre- and post-test standard scores, then divided the difference by the standard deviation of the pre-test to obtain an effect size quotient. Lastly, to calculate the

standard score points, the effect size quotient was multiplied by 15 as recommended by Kilpatrick (2015). This concept of effect size quotient is distinct from the traditional concept of effect size widely used in statistics.

SCREENINGS USED IN THE STUDY

CTOPP-2 Elision

The extent to which an individual can say a word and then say what is left after dropping out designated sounds. For example, the examinee is instructed, "Say, Bold." After repeating "bold", the examinee is told, "Now say "bold" without the /b/. The correct response is "old" (Wagner, Torgesen, Rashotte, & Pearson, 2013).

Test of Word Reading Efficiency, Second Edition (TOWRE-2)

Students read a list of real words aloud and a list of nonsense words for 45 seconds each. This test is a quickly administered highly informative test of not only word reading accuracy, but fluency as well. In the pre-test phase of this study, it is observed that low word reading scores (especially nonsense words) accompany low phonemic awareness scores (Torgesen, Wagner, & Rashotte, 2012).

STANDARD SCORES

The researchers looked at pre- and post-test results of kindergarten, first, and second graders. Standard scores were based on Kilpatrick's definition of minimal, moderate, and highly successful impact on reading skills.

Level of Success (Kilpatrick, 2015)	Increase in Standard Score Points (Pre-Post)
Minimal	0-5
Moderate	6-8.9
Highly Successful	9+

Standard score analysis can be used to compare outcomes between intervention groups and control groups – students who did not receive the intervention. In this study, comparing groups with similar instruction and then comparing normative scores – in essence, comparing apples to apples, calculated standard scores by using normative tests such as CTOPP-2 and TOWRE and pre- and post-test results with paired samples.

THE RESULTS

Using an EBRI program that included an emphasis on phonemic awareness, phonic decoding instruction and reinforcement, and opportunities to apply these skills to reading connected text, the researchers set out to investigate if this type of program had minimal, moderate, or highly successful effectiveness as outlined by Kilpatrick (2015). By converting effect size quotient to standard scores using Kilpatrick's method, a program would be highly successful if standard scores rose nine (9) or more points between the pre- and post-test.

The first analysis looked at the impact of the EBRI using the CTOPP-2 Elision test measuring phonemic awareness. A total of 199 students ranging in age from kindergarten to second grade participated. All of these students scored at the 30th percentile or below on the pre-test. The mean from pre- to post-test for these students rose 1.286 score points. This calculated to an effect size quotient of .768 and translated to a standard score increase of 11.516 points. Table 1 shows a *highly successful* program outcome using Kilpatrick's methodology (2015).

Table 1
C-TOPP-2 Results

	C-TOPP-2 Scaled Score	Post C-TOPP-2 Scaled Score	Mean Difference	Effect Size Quotient	Standard Score Points
N Valid:	199	199	1.286	.768	11.516
Mean:	6.362	7.648			
Std. Dev:	1.676	3.406			

Using the TOWRE test for phonemic decoding, the study looked at pre- and post-test results of 120 first and second graders who scored below the 30th percentile on the pre-test. The mean between the pre- and post-test for these students rose 6.24 score points. This calculated to an effect size quotient of .596 and translated to a standard score increase of 8.937 points. Table 2 shows a *moderately effective* program outcome using Kilpatrick’s methodology.

Table 2
TOWRE Phonemic Decoding Results

	TOWRE Phonemic Decoding Scaled Score	Post TOWRE Phonemic Decoding Scaled Score	Mean Difference	Effect Size Quotient	Standard Score Points
N Valid:	120	121	6.342	.596	8.937
Mean:	79.625	85.967			
Std. Dev:	10.644	16.100			

Using the TOWRE for sight words, the study looked at 128 students scoring below the 30th percentile of the pre-test and found a mean increase of 6.602 score points. Table 3 calculated to an effect size quotient of .759. Using Kilpatrick’s methodology, this translates to an increase of 11.387 standard score points - a *highly successful* outcome.

Table 3
TOWRE Sight Words Results

	TOWRE Sight Words Scaled Score	Post TOWRE Sight Words Scaled Score	Mean Difference	Effect Size Quotient	Standard Score Points
N Valid:	128	128	6.602	.759	11.387
Mean:	80.875	87.477			

Std. Dev:	8.696	19.420
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IMPLICATIONS

All three analyses indicated at least a highly moderate to highly successful increase in standard score points across assessment of phonological and sight reading abilities in students identified as having reading difficulties. This research verified an EBRI program that incorporates phonemic awareness, phonic decoding, and practice in reading words in context has a *positive effect on students who score below the 30th percentile* on pre-tests of the normative reading tests used in the study throughout the 2016-2017 school year.

The research supports the assumption of a commercially purchased EBRI program (*), focused on these attributes, had highly successful effects on students who scored below the 30th percentile on pre-test screenings. School leaders can be confident this type of instruction will help their struggling readers at the Tier 1 level even before they may be identified as dyslexic.

CONCLUSION

Missouri school leaders have been challenged by recent legislation to provide screening for dyslexia and training for teachers about dyslexia. This study was conducted to assist school leaders who are looking for reading instruction programs for struggling readers. As noted in this article, EBRI should take the attributes of phonemic awareness, phonics instruction, and transfer of these skills to reading practice into account to ensure at least highly moderate effects on closing the gaps in reading between these students and their more successful peers. Missouri principals pressed to implement instruction to close the gap amongst struggling readers at - risk for dyslexia now has a study (based on students from Missouri) that affirms the quantifiable success of an EBRI among students struggling in reading.

* Pathways to Reading

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