Spring 2021

A Systematic Review of Reading Interventions for English Language Learners

Alfredo Gomez
Western Kentucky University, alfredo.gomez625@topper.wku.edu

A SYSTEMATIC REVIEW OF READING INTERVENTIONS FOR ENGLISH LANGUAGE LEARNERS

A Specialist Project
Presented to
The Faculty of the Department of Psychology
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
Of the Requirements for the Degree
Specialist in Education

By
Alfredo Gomez

May 2021

A SYSTEMATIC REVIEW OF READING INTERVENTIONS FOR ENGLISH LANGUAGE LEARNERS

Date Recommended April 7, 2021

Dr. Sarah Ochs, Director of Specialist Project

Dr. Carl Myers

Dr. Melissa Baker

Associate Provost for Research and Graduate Education

ACKNOWLEDGEMENTS

I would like to thank Dr. Ochs for the support she's provided throughout graduate school and this writing process. I appreciate the genuineness and warmth she showed, making it easy to work with and to learn from.

I would also like to thank all of the professors who have made such big impacts on my life in one way or another. This includes Dr. Poffenberger, Dr. Winslow, and Dr. Incera for providing the opportunities for me to develop as a student, for their faith and support throughout undergraduate school, and for facilitating the graduate school application process for me. I would like to include Dr. Baker for taking the time to review my work and for being a part of my committee. I also want to include Dr. Myers for the knowledge he has provided and for giving me an opportunity to be a part of this program.

Lastly, I would like to thank my mom, dad, and my brothers for the sacrifices they have made and for the constant love and support. I want to thank my parents, Helia and Alfredo, specifically for the faith and support they have given during my studies, making it easier to obtain an education for which I am forever grateful for. They remain a constant source of inspiration and motivation.

Special shout out to Leon and Callie for the companionship over the years.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

A SYSTEMATIC REVIEW OF READING INTERVENTIONS FOR ENGLISH LANGUAGE LEARNERS

Alfredo Gomez May 2021 37 Pages

Directed by: Dr. Sarah Ochs, Dr. Carl Myers, and Dr. Melissa Baker

Department of Psychology Western Kentucky University

The majority of fourth graders (65%) read below grade level, making it more likely for them to fall behind as curriculum progresses. English Language Learners (ELLs) are more likely to fall behind because of the additional risks and barriers they may face. In order to provide appropriate, evidence-based, reading instruction for this population of students, research was examined, summarized, and synthesized to determine which components of reading were targeted, their grade level, their native language, and intervention effectiveness.

A systematic review of the literature shows how fundamental the five components of reading are to the development of ELL students' ability to read. The common theme among the 12 intervention studies was how they targeted one or more of the foundational components of reading instruction. Participants' native language did not interfere with increases in students' reading skills. Students' grade levels ranged from pre-school to fifth grade. Eleven out of twelve research studies indicated small, moderate, or large increases to students' reading skills.

Introduction

The first three years of school are an important time for students to develop the necessary reading skills required for further advanced curriculum, yet 65% of fourth grade students read below grade level in 2019 (The Nation's Report Card, 2019). These students are likely to fall even farther behind as the curriculum progresses and becomes more advanced, affecting their academic achievement. Students who are English Language Learners (ELLs) may be even more susceptible to reading difficulties due to additional risks and barriers when compared to same-aged peers. Therefore, it is important to understand the fundamental skills that contribute to reading success, additional risks and barriers facing ELL students, which evidence-based reading interventions are most effective, and the components within them that increase students' reading skills. Research will be identified, summarized, and synthesized to examine effective evidence-based reading interventions used to increase ELL students' reading skills. The components of reading will be examined (i.e., phonemic awareness, phonics, fluency, vocabulary development, or comprehension), students' grade levels, and their native language.

Reading

There are five essential components of reading instruction: Phonemic Awareness, Phonics, Reading Fluency, Vocabulary Development, and Reading Comprehension (National Reading Panel, 2000). Phonemic Awareness (PA) is the ability to listen to, identify, and modify phonemes. Phonemes are the smallest units of sound that when stringed together form words. For example, the word, "crab" is made of 4 individual phonemes: /c/r/a/b/. According to the National Reading Panel (NRP, 2000), there are six

strategies that can be used as instruction to increase and assess a student's PA: phonemic isolation (identifying individual sounds in words), phonemic identity (identifying the common sound among a few words), phoneme categorization (identifying the word with a different sound among words with similar sounds), phoneme blending (combining separate spoken sounds into a word), phoneme segmentation (breaking a word into its separate phonemes), and phoneme deletion (identifying a word after deleting one of its phonemes).

Phonics is the ability to recognize the different sounds each letter in the alphabet makes (letter-sound correspondence), recognize spelling patterns, and apply this information when reading. Phonics instruction targets these areas and is typically given to primary grade students learning to read and to those who struggle learning to read. The NRP (2000) recognizes six instructional approaches used to increase a student's phonics skills: synthetic phonics (turning letters into phonemes and blending them into words), analytic phonics (examining letter-sound relations after a word is identified), embedded phonics (increasing letter-sound correspondence during reading sessions completed for the purpose of pleasure rather than skill development), analogy phonics (using parts of already known written words to create new words), onset-rime phonics (identifying the initial consonant in a word and the following vowels and consonants), and phonics through spelling (changing sounds into letters to write words). The differences between these strategies are not always noticeable and two or more may be combined to form a phonics program. The purpose of these programs is to increase students' familiarity with the alphabetic elements so that students can generalize that information and develop their reading and written language comprehension skills.

Reading fluency is the ability to read text with speed, accuracy, and proper expression (NRP, 2000). Reading fluency is dependent on a student's word recognition skills. Students who recognize words more quickly spend less energy deciphering words and more energy on comprehending the text (Pinnell et al., 1995). Students who have low fluency skills may have more difficulty understanding (i.e., reading comprehension) what they read. Instructional strategies intended to increase students' reading fluency are grouped into two approaches (NRP, 2000). The first approach includes procedures that focus on repeated oral reading practices such as repeated reading, neurological impress, radio reading, paired reading, shared reading, and other similar techniques. The second category includes procedures that focus on increasing independent/recreational reading such as silent reading programs and incentive programs.

Next, vocabulary development is the ability to increase the number of words used to read and comprehend written text (NRP, 2000). Children use words they already know to understand what they read. The more words a child knows, the easier it is for them to understand. Not every word read needs to be known, however, too many new or difficult words makes understanding the text more difficult. According to the NRP (2000), there are five main methods of teaching vocabulary: explicit instruction, implicit instruction, multimedia methods, capacity methods, and association methods. Explicit instruction tasks students to learn a given set of definitions or its attributes. Implicit instruction involves exposing students to different words and includes many opportunities to read. Multimedia methods may include hypertext or graphic representations, among other strategies. Capacity methods are used to increase reading fluency, allowing cognitive

resources to concentrate on the meaning of words. Association methods encourage learners to create connections between known and unknown words.

Reading comprehension means understanding the content of the text and is the reason we read (NRP, 2000). It involves a combination of cognitive processes to perform and includes areas of instruction that develop student's vocabulary and text comprehension skills. Cognitive processes involved in reading comprehension include working memory, verbal comprehension, and processing speed. The development of these processes is critical to increasing reading comprehension skills. Another important component involves preparing teachers by providing them with comprehensive strategies that facilitate the development of student's reading comprehension skills.

Taken together, these core components make up the academic area known as reading. School psychologists are well positioned to support the assessment and intervention of student academic skills, namely reading. The National Association of School Psychologists (2020) Practice Model outlines ten domains of practice for school psychologists, one of which being academic interventions and instructional supports. In this domain, school psychologists are expected to understand the variety of influences on learning, including culture.

Response to Intervention

School psychologists and other school personnel often facilitate assessment and intervention of student learning through a tiered system called Multi-tiered systems of support (MTSS) or response to intervention (RTI). While RTI has since significantly expanded in scope, the term was originally used for one way of diagnosing disabilities in the area of reading through measuring a student's response to intensive instruction or

intervention (Schulte, 2015). More broadly, RTI is a three-tiered, evidence-based approach to providing individualized, appropriately intensive interventions to students in general education (RTI Action Network, n.d.). In this model, skill data (in this case, reading) are collected frequently and used to identify risk, plan intervention, and monitor progress toward a goal. Data are collected frequently over time and used to determine students' goals and RTI placement across three tiers.

Tier 1 includes all students in general education who receive instruction from an evidence-based core curriculum (Brown-Chidsey & Steege, 2010). All students are screened periodically to establish an academic and behavioral baseline and to identify those who are not responding appropriately. Student progress is often measured using Curriculum Based Measures (CBMs) and those who are not making the desired progress may need the more intense and individualized interventions provided in Tier 2.

Tier 2 continues to include assessment through progress monitoring and instruction or interventions that are more focused, intensive, or individualized than Tier 1 (Brown-Chidsey & Steege, 2010). Additional interventions are provided to students who are not responding appropriately to Tier 1 instruction. Students in Tier 2 are more frequently exposed to more intensive interventions in small group settings in addition to the general curriculum. This may include providing additional reading instruction 30 minutes per day to students in small groups (3-6) with a focus on increasing students' reading skills, among other reading interventions. Data collected from students in Tier 2 are used to assess and monitor reading skills such as comprehension or fluency.

If implemented appropriately, this school-wide, multi-tiered prevention approach can be used to meet the needs of all students. It shifts the focus from classifying students

with disabilities towards the evaluation and delivery of evidence-based instruction in the general education classroom (Brown-Chidsey & Steege, 2010). Unfortunately, some students continue to demonstrate inadequate progress and require the more intensive and individualized interventions provided within Tier 3. If students continue to struggle, information gathered across the RTI process can be used to examine eligibility for a reading disability.

Problems Associated with Reading

According to Learning Disabilities Association of America (LDA, n.d.), learning disabilities occur across academic areas such as math and writing, but specific learning disabilities in reading account for approximately 80% of all learning disabilities.

Learning disabilities can be assessed differently across settings (e.g., school or clinic) and sometimes professionals. In schools, students are evaluated for a specific learning disability in order to determine eligibility for special education services. The federal definition of a specific learning disability used in the schools comes from the Individuals with Disabilities Education Act (2004). It states that a specific learning disability is a disorder in one or more basic psychological processes (i.e., reading). Oftentimes, deficits may overlap, but they may also be separate and distinct (Moats & Tolman, 2009). Phonological processing deficits occur in approximately 70-80% of students with reading disabilities. Phonological processing deficits occur when students struggle to remember the individual sounds (phonemes) associated with individual written letters (graphemes). Students with phonological processing deficits ultimately struggle with both processing speed and reading comprehension. Processing speed, more commonly known as reading fluency, is a students' ability to read accurately and

fluently. Approximately 10-15% of students have processing speed deficits. These students struggle to quickly recognize words and recall of word spellings, despite doing well on tests of phonological skills. The last 10-15% of students who struggle to read do so because of deficits in reading comprehension (Moats & Tolman, 2009). This occurs when students struggle to discern the meaning of read passages, despite being able to spell and read fluently. This is typically associated with deficits in social reasoning, abstract verbal reasoning, or language comprehension.

However, reading problems can be associated with a variety of variables including vision/hearing problems, lack of adequate instruction, a lack of experience, and/or having deficits in psychological processes that impact reading (Moats & Tolman, 2009). Vision and hearing concerns are factors that must be ruled out when assessing and identifying a student with a reading deficit because these factors are integral to the development of appropriate reading skills. How we see, what we see, and how efficiently an individual uses their eyes has a direct impact on their learning process (including reading). Research shows that the adoption of corrective measures improves individuals' visual comfort and has a statistically positive impact on participants' performance on end-of-year exams (Kovarski et al., 2015). Hearing concerns, if left untreated, can cause delays in speech and language development, typically resulting in poor school performance (Victory, 2020). Students with hearing deficits are just as capable as other students, they just require accommodations to help them compensate for their difficulties. If accommodations are not provided, these students may struggle with oral changes to homework assignments, listening to teachers with unfamiliar accents, or listening to people who speak quickly. Despite the provision of accommodations, some school

subjects are inherently more difficult for students with hearing deficits including those involving language concepts like vocabulary and language arts.

Students who lack experience with reading typically include English Language Learners (ELLs). These are students who are learning English in addition to their native language while attending school and make up approximately 10% of the total student enrollment across the United States (National Center for Education Statistics, 2017). ELLs typically have limited receptive and/or expressive English language skills, making it difficult for them to participate fully in the general curriculum. ELL students who struggle with reading are typically identified through Curriculum Based Measures (CBM) that assess their reading skills such as phonemic awareness, fluency, vocabulary knowledge, and reading comprehension. This provides examiners with information allowing them to determine a baseline, to provide individualized instruction, and to monitor their progress.

English Language Learners in Schools/Education

ELL students made up 10.1% of all students in public schools during the fall of 2017, representing an increase when compared to the 8.1 percent of ELL students enrolled during the fall of 2000 (National Center for Education Statistics, 2017). States with more than 10% enrollment of ELL students included Alaska, California, Colorado, Florida, Illinois, Kansas, Nevada, New Mexico, Texas, Washington, and the District of Columbia. States reporting the highest number of ELL student enrollment in public schools included California (19.2%), Texas (18%), and Nevada (17.1%). States reporting the lowest number of ELL student enrollment included Vermont (2.2%), Montana (2.2%), and West Virginia (.08%). When comparing public school enrollment of ELL

students by location, the majority of students were enrolled in the city (14.7%), followed by suburban areas (9.6%), towns (6.8%), and rural areas (4.1%).

Data show that the majority of ELL students enrolled in public schools are those from lower grades including Kindergarten through 5th grade, with an average population of 14.3% (NCES, 2017). Older ELL students from 6th grade through 12th grade made up an average of 6.7% of the population of students in public schools. As ELL students advance through elementary school, they develop their English proficiency leading to a reduction of ELL students in the upper grade levels.

In 2017, the majority of ELL students (75%) lived in a home in which Spanish was the spoken language, followed by 2.7% of students whose home language was Arabic, and 2.1% whose home language was Chinese (NCES, 2017). When examining ethnicity, 76.5% of ELL students in public schools were Hispanic, followed by Asian ELL students (10.7%), White ELL students (6.6%), and Black ELL students (4.3%). Across all ELL students in public schools, 14.3% of the population were identified as students with disabilities.

The increase of ELL students in the public-school population has led the National Association of School Psychologists (NASP) to require training that includes the developmental process of language acquisition and acculturation, their effect on standardized performance, and the effectiveness of instructional strategies and interventions (NASP Position Statement: Bilingual Services, 2015). This training is now required in an effort to address the underrepresentation of ELL students in gifted education, underrepresentation in special education in the primary grades, and overrepresentation in special education beginning in 3rd grade. These issues exist partly

due to poor psychological assessment practices, limited access to effective instruction, lack of understanding about language acquisition, inappropriate special education referral practices, and limited training. ELL students require effective and comprehensive supports and services to help them succeed academically, socially, behaviorally, and emotionally. Therefore, it is important that school psychologist know how to effectively ensure and provide prevention, assessment, consultation, intervention, advocacy, and family-school collaboration services for ELL students.

Purpose of the Study

Reading is an important area, contributing directly to the academic success of all students, yet 65% of fourth grade students read below grade level in 2019 according to the National Assessment of Educational Progress (2019). These issues made reading the most common category of SLD special education. For some groups of students, the failure rate is even higher.

About 50% of African-American, Hispanic, and students in poverty scored below basic on the NAEP assessment compared to same-aged peers. Students learning a second language face additional risks with regard to oral language development including the amount of exposure to language, exposure to print, whether English is spoken at home, background experiences, parents' level of education, and transitions and disruptions in the student's home life. Additionally, the number of ELL students are increasing in public schools across the nation. In order to improve ELL students' reading skills, it is imperative to understand the variables that facilitate the attainment of reading skills and which evidence-based reading interventions are most effective. The purpose of this literature review is to identify, summarize, and synthesize studies that examine effective

evidence-based reading interventions used to increase and maintain ELL students' reading skills. Specifically, this project will examine which components of reading are targeted (i.e., phonemic awareness, phonics, fluency, vocabulary development, or comprehension), which grade levels were studied, and native language.

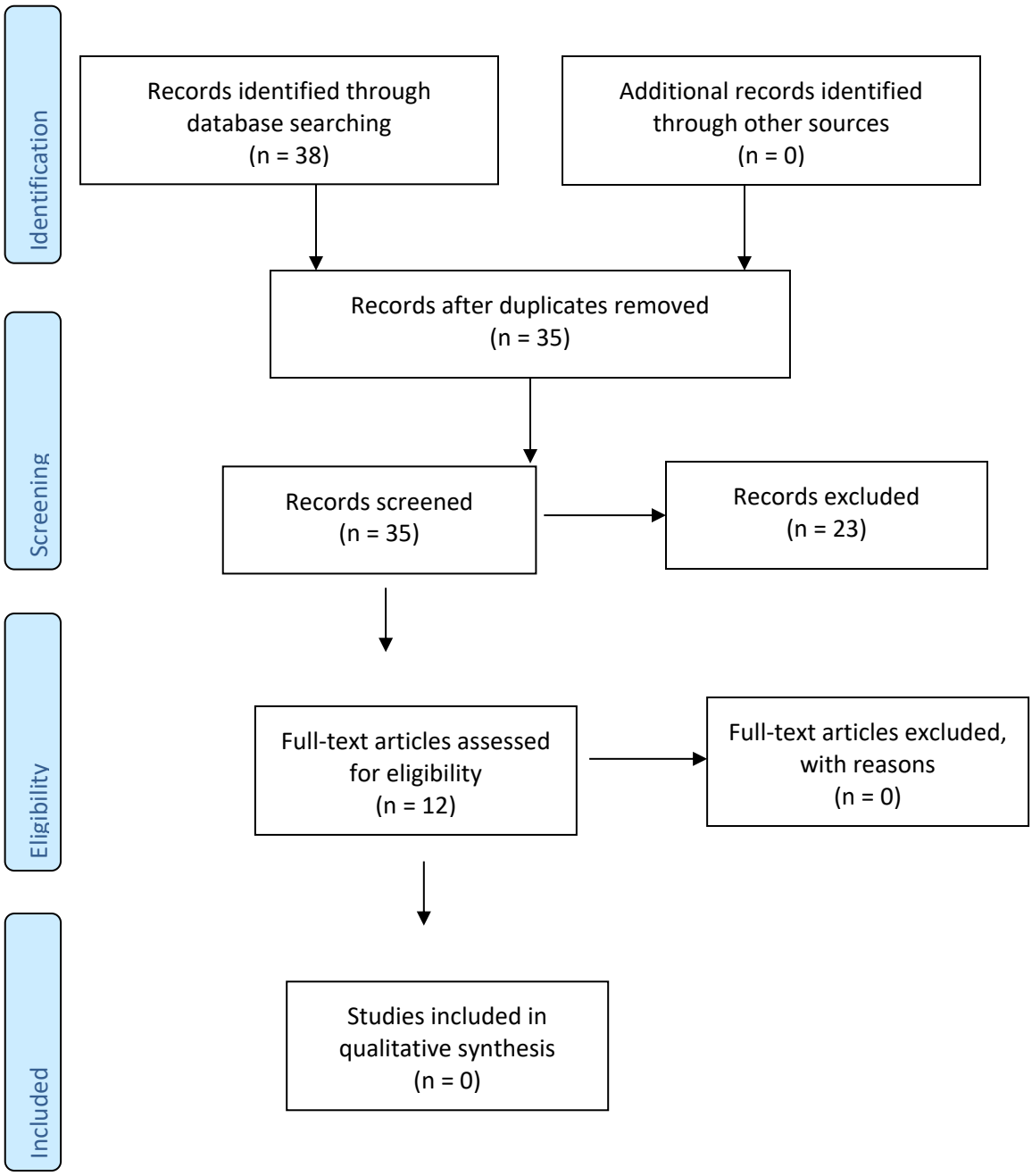
Methods

Procedures

This specialist project was an analysis of existing, peer-reviewed literature regarding research-supported reading interventions used to increase and maintain ELL students' reading skills. Electronic library database APA Psycinfo was used to identify published, peer-reviewed articles using the keywords in the following combinations: "English Language Learner," "ELL" or "English Second Language," "ESL" and "reading interventions" or "reading strategies." Studies that were peer reviewed and published between 2010 and 2020 were included. Articles were excluded if they did not test a reading intervention, were not conducted in the United States, or if they were not written in English. Dissertations and theses were also included in the initial search. Articles were narrowed based on inclusionary criteria using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Moher et al., 2009). Initial results yielded 38 articles. After removing duplicates, 35 articles were reviewed more closely. Article titles and abstracts were examined resulting in the removal of 23 articles. These articles were removed because their content was not relevant to the study of interest or because they were meta-analyses. This resulted in a total of 12 articles for this project which are organized below by year of publication.

Figure 1

Preferred Reporting Items for Systematic Reviews and Meta-Analyses



Results

Across the 12 articles reviewed, all of the students who participated were in pre-school or elementary school with no studies including 4th grade. Research participants' grades varied across articles, with some studies focusing on one grade in particular, while other research articles examined intervention effects across students from several grades. One article included participants in pre-school, five articles included participants in kindergarten, six articles included participants in 1st grade, four articles included participants in 2nd grade, three articles included participants in 3rd grade, and three articles included participants in 5th grade. Of the 12 articles, seven used participants whose native language was Spanish, one included participant whose native language was Somalian, three included participants with a variety of native languages, and one included participant whose native language was not listed. Most studies did target at least one of the five components of reading with two studies examining phonemic awareness, one studying phonics, seven examining fluency, seven examining vocabulary, and eight looking at reading comprehension. Other identified components of reading included morphological awareness, phonological awareness, and listening comprehension. Full study characteristics are presented in Table 1.

According to research by Lugo-Neris et al. (2010), students who received reading instruction in English with word expansions in Spanish outperformed their peers who received English reading instruction with word expansions in English across naming, receptive knowledge, and expressive definitions.

Researchers in this study examined the effects of a story book reading intervention designed to increase students' vocabulary skills. The independent variables

included English instruction in the form of a shared storybook program with word expansions in English and a shared storybook program with word expansions in Spanish. Word expansions can be described as further explanation of novel words to students. The dependent variables included naming, expressive definitions, and receptive knowledge.

Participants included 22 Latin American students with limited English proficiency who were between the ages of 4 and 6. All children were identified as speaking Spanish at home and as being more proficient in Spanish than English. Students were administered standardized assessments to gather pretest and posttest data on their language proficiency in English and Spanish. This within-subjects experiment consisted of storybook reading sessions in English with word expansions for 15-20 minutes a day, three times a week. One story book was read per week for four weeks, resulting in a total of four story books. The first two story books included word expansions in English and the last two story books included word expansions in Spanish.

Results showed significant differences between these preschoolers' pretest and posttest scores across all three dependent measures associated with students' vocabulary skills. This lends support to the idea that students' vocabulary skills can be increased when they are provided with further explanation of novel words in their native language, in this case Spanish.

Table 1

Characteristics of Articles Reviewed

Study	Grade(s)	Native Language	Reading Component(s)	Intervention Effectiveness
Lugo-Neris et al. (2010)	Pre-school	Spanish	Vocab.	Small
Ross & Begeny (2011)	2	Spanish	Fluency	Moderate
Cruz de Quiros et al. (2012)	1, 2	Spanish	Vocab., Listening Comp.	Moderate
Goodwin et al. (2013)	5	Spanish	Morph. Awareness, Phon. Awareness, Reading Comp.	Non-significant to Moderate
Tong et al. (2014)	K, 1, 2, 3, 5	Spanish	Fluency, Vocab., Reading Comp.	Moderate
O'Connor et al. (2014)	K, 1, 2	Spanish	Phon. Awareness, Fluency, Vocab., Reading Comp.	Small to Large
Burns et al. (2017)	2, 3	Somalian, Spanish, Hmong, & Other Languages	Phonics, Fluency, Vocab., Reading Comp.	Non-significant
Castro-Olivio et al. (2017)	K	Spanish	Phon. Awareness	Small to Moderate
Amendum et al. (2017)	K, 1	Spanish, Creole, Arabic, Chinese, & Greek	Fluency, Reading Comp.	Small
Cassady et al. (2018)	K, 1	--	Phon. Awareness, Phonics, Vocab., Reading Comp.	Non-significant to Small
Johnston et al. (2018)	3, 5	Viatnamese, Tagalog, & Cantonese	Fluency, Vocab., Reading Comp.	Non-significant to Small
Barber et al. (2018)	1	Somalian	Fluency, Reading Comp.	Small to Large

In a study examining the effects of two reading fluency interventions (one-on-one and small groups), 2nd grade students showed significant increases in their reading fluency skills when receiving a reading fluency intervention condition compared to a no treatment condition (Ross & Begeny, 2011). Participants in this within-subjects study included five second-grade students whose first language was Spanish. The independent variable was an intervention with three conditions: no treatment, one-on-one, and a small-group condition. The dependent variable included students' reading fluency skills. Researchers measured students' pretest and posttest reading fluency skills using standardized assessment subtests and Curriculum Based Measures of Reading (CBM-R).

Results showed significant increases in reading fluency across all five second grade students whose native language was Spanish (Ross & Begeny, 2011). The one-on-one reading fluency condition showed significant increases across all students and retention gains for three students compared to the no treatment condition. The small groups condition showed significant gains in reading fluency for all students and retention gains for two of the five students compared to the control condition. Although the one-on-one condition yielded the most effective results, the small groups condition still outperformed the no treatment condition across all students.

Research by Cruz de Quiros et al. (2012) sought to examine the effects of a 2-year structured story reading intervention on bilingual students' oral language proficiency in English and Spanish. The independent variable included a multi-component 2-year reading intervention known as 'Story retelling and higher order thinking for English Literacy and Language Acquisition' (STELLA). Components within the intervention included story reading, retelling, instructional strategies, vocabulary instruction, story

grammar, listening and use of higher-level questions and question generation. The dependent variable in this article was oral language proficiency, which researchers defined as including vocabulary and listening comprehension.

Participants in this between-subjects sub-study were randomly selected 2nd graders from a pool of participants from a larger longitudinal research project whose main purpose was to identify best practices in increasing native Spanish speaking students' (K-12th grade) English language and literacy skills (Cruz de Quiros et al., 2012). Seventy-two second grade students were included in this research, with 38 students attending a school receiving intervention treatment and 34 students attending a comparison school.

Results revealed that second grade Spanish speaking students in treatment schools who received the STELLA reading intervention outperformed the matched students in the comparison schools who received no treatment across both vocabulary and listening comprehension. Additional analysis revealed that students in treatment schools showed increased scores in their native language (Spanish) compared to their second language (English). This research supports the idea that bilingual students' vocabulary and listening comprehension skills will benefit from a multi-component structured story reading intervention when compared to a control group.

Goodwin et al. (2013) examined how morphological awareness and phonological awareness affects 5th grade students' reading comprehension. The independent variable in this study was a second language reading model that comprised of morphological awareness and phonological awareness. The dependent variable was students' reading comprehension ability, which was assessed using seven different reading measures.

This longitudinal research included 157 5th grade ELL students across schools in Chicago, Boston, and El Paso. Students' reading comprehension was measured using the Woodcock language proficiency battery-revised (WLPB)-word attack (grade 4), computer based academic assessment system (CAAS) nonword accuracy (grade 4), extract the base (ETB)-no orthographic change (grade 4), ETB-orthographic change (grade 4), WLPB-letter-word (grade 5), WLPB-reading vocabulary (grade 5), and WLPB-passage comprehension (grade 5). Data was collected twice, at the end of fourth and fifth grade. Researchers used a multiple regression model to examine the unique contributions that morphological awareness and phonological awareness had on students' reading comprehension ability.

According to results, morphological awareness did not directly contribute significantly to Spanish speaking students' reading comprehension skills, however, it did make a moderate contribution to reading vocabulary, which also made a moderate contribution to reading comprehension. Phonological decoding made a large, significant direct contribution to word reading, which in turn made a significant contribution to reading comprehension controlling for morphological awareness. This research suggests that morphological awareness contributes much less significantly and more indirectly to reading comprehension when compared to phonological processing, which has a much more significant and direct effect on 5th grade ELL students' reading comprehension.

Tong et al. (2014) examined the effect of two longitudinal interventions designed to increase ELL students' science and literacy achievement. More specifically, researchers' first intervention examined the effects of an English reading literacy intervention with embedded science instruction on 5th grade Hispanic ELL students'

science and literacy achievement. The second intervention examined the effects of a science instruction intervention with embedded English language/reading literacy instruction on Kindergarten students until 3rd grade.

Information from 56 ESL students was gathered from a larger randomized interdisciplinary study (Tong et al., 2014). Students in the 5th grade treatment group were provided 85 minutes of science intervention, which consisted of using the 5 E- model (i.e., Engage, Explore, Explain, Elaborate, and Evaluate) and developing students' ability to ask questions using Bloom's taxonomy with verbs including: Identify, describe, explain, analyze, and create. The English language/reading literacy intervention was incorporated into the science intervention by including relevant reading and writing activities. These activities incorporated grade level material that explained concepts, increased vocabulary development, and included partner reading to increase reading comprehension and fluency. Students within the control condition received science instruction using the typical 5th grade curriculum aligned to state standards.

The interdisciplinary intervention used for students from Kindergarten to 3rd grade examined the effects of an English language/reading literacy intervention embedded with science instruction (Tong et al., 2014). Students in Kindergarten received 75 minutes of intervention while students from 1st – 3r grade received 90 minutes of intervention during their ESL block. Scientific tasks were integrated into students' phonics, vocabulary, and fluency for students in Kindergarten and first grade. Scientific tasks were integrated into students' daily oral language and writing activities from first grade to third grade.

Researchers used standardized tests and district developed benchmarks to measure students' Science and English language/reading literacy achievement. State

standardized tests were used to assess students' reading and scientific knowledge. Other assessments were used to assess students' reading fluency and language proficiency which measures ELL students' receptive and expressive vocabulary, verbal reasoning, decoding skills, comprehension, punctuation, and expression.

Results showed that 5th grade students who received the science instruction embedded with English language/reading literacy outperformed students from the control group in English oral reading fluency, knowledge of word meanings, and mastery of science concepts comparable to grade level. Students who received the K-3 English language/reading instruction embedded with science instruction developed more quickly in English oral reading fluency (i.e., expressive and receptive vocabulary knowledge, verbal reasoning, and word meanings) and comprehension skills. According to standardized assessments, these students also approached or outperformed their native English peers. Researchers also discovered that students who received both imbedded interventions benefitted the most compared to students who only received one of the imbedded interventions or to those in the control group. This research lends support to the use of an interdisciplinary intervention designed to increase ELL Spanish speaking elementary students' reading fluency, vocabulary skills, and reading comprehension

Researchers examined the effects of a Tier 2 reading intervention on students reading achievement in a 3-year longitudinal study included students from 5 schools across 3 cohorts: Kindergarten, first-grade, and second-grade (O'Connor et al., 2014). Students either received a Tier 2 reading intervention during kindergarten, first, or second grade or were placed in the control group.

The independent variable in this research was a Tier 2 intervention consisting of small group instruction for 20 minutes for students in kindergarten and 25 to 30 minutes for students in first and second grade, four times per week (O'Connor et al., 2014). Kindergarteners' Tier 2 intervention was developed from a curriculum designed to increase students' oral language, phonological awareness, and letter knowledge. First graders' Tier 2 intervention included letter-sound, decoding, sight word identification, and reading of sentences and decodable books in small groups for about 30 minutes four times a week. Second graders' Tier 2 intervention included the same activities as first graders with additional lessons on word meanings and comprehension checks. The dependent variable in this study was students' reading achievement. Reading achievement was examined by measuring students' reading fluency, phonemic awareness, vocabulary development, and reading comprehension.

Results showed an increase in reading achievement for these native Spanish speaking students who received the Tier 2 intervention compared to matched students in the control group. Students who were ELL showed increased benefits when they accessed Tier 2 interventions during kindergarten compared to ELL students who received Tier 2 intervention access during first or second grade. However, by the end of second grade, the scores between these groups decreased and were no longer significant.

Burns et al. (2017) examined the association between English language proficiency screening information and growth during reading interventions. Researchers defined English language proficiency as a multi-component construct that includes listening, writing, reading, and speaking. This information can be used to design screeners and reading interventions for ELL's. Unfortunately, many current English

language proficiency tests have low validity. Curriculum based measures in reading fluency (CBM-R) and standardized assessments measuring reading comprehension and vocabulary have been shown to be valid measures of reading achievement and growth. This research sought to examine the association between students' English language proficiency information and their reading growth after receiving interventions.

The independent variable comprised of tiered reading interventions that included vocabulary, phonics, and fluency training with second and third grade students (Burns et al., 2014). The dependent variables included students' reading comprehension and fluency. This was measured using CBM-R, standardized assessments, and the Measure of Academic Progress for Reading (MAP-R). The MAP-R is used to screen students' reading skills. Researchers also used the Assessing Comprehension and Communication in English State-to-State for English Language Learners (ACCESS) to assess students' English language proficiency in reading, writing, listening, and speaking. Information gathered from ACCESS is used to assign students an English proficiency level, with the last level representing proficiency in English.

Participants were 201 students in second and third grade from one school. Most students were of African descent (37%), followed by Hispanic students who spoke Spanish as their first language (35%), and then students of Asian descent and students from other countries made up the remaining percentage. All participants received targeted reading interventions in phonics, fluency, and vocabulary.

According to correlational analysis, the ACCESS scores did not significantly correlate with reading growth from interventions, indicating that standardized achievement tests and CBM-Rs are better predictors of reading achievement than this

language proficiency measure. In support of standardized measures and CBM-Rs, second and third grade students who scored the lowest on these measures showed increases in words read correctly per minute, lending support to the importance of early reading interventions.

In a pilot study, Castro-Olivio et al. (2017) examined the effects of a comprehensive, culturally adapted intervention for ELL students designed to increase their reading skills and decrease behavioral problems. There were three ELL kindergarten participants whose native language was Spanish in this single-subject, multiple-baseline study.

The independent variable in this study was a culturally adapted version of an evidence based behavioral program known as First Steps to Success (FSS) combined with a direct instruction reading intervention (Castro-Olivio et al., 2017). The FSS intervention incorporates classroom management training, direct social skills training, and parent training. The direct instruction reading intervention focused on four domains including oral language instruction/vocabulary, phonemic awareness, letter sounds, and decoding/blending skills. Researchers used an interval recording system to observe and measure the percentage of time students engaged in problem behavior. Student reading was measured using CBMs.

Results showed an increase on students' academic engagement, reading skills, and a decrease in behavioral problems after implementing the combined FSS and reading intervention. Regarding students' behavioral problems, all three students showed decreases after implementation. Regarding students' reading skills, there was a small to

moderate relationship between the combined intervention and reading outcomes, lending support to the use of a blended intervention.

Amendum et al. (2017) examined the effects of a targeted reading intervention delivered via webcam technology on ELL students' early reading progress. Participants' information was pulled from a larger, 3-year randomized study. This research used 108 ELL students across 47 classrooms randomly assigned to treatment or control conditions. Students included 70 kindergarteners and 38 first-graders. Participants included students with a variety of native languages, however, most students' (93%) native language was Spanish. Participants were divided into four groups based of treatment and struggling reader status: treatment struggling, control struggling, treatment nonstruggling, and control nonstruggling.

The independent variable in this study was a targeted reading intervention delivered through webcam. Teachers used specific strategies with individual learners to prevent reading failure. Teachers received training from literacy coaches once a week that helped them individualize instruction for their struggling ELL readers. Students received 15 minutes of intervention 3 to 4 times per week for roughly 8 weeks. Students' reading intervention comprised

of 3 activities designed to increase students reading fluency and comprehension, the dependent variables. Student progress was measured during the fall and spring using subtests from a standardized assessment.

Results indicated that struggling ELL students significantly outperformed struggling ELL students in the control condition in reading fluency. However, there were no differences among reading comprehension between both groups. Even though

struggling ELL students showed increases in reading fluency, it was not enough to close the gap between them and non-struggling ELL students.

In a study of kindergarten and first-grade ELL students, Cassady et al. (2018) examined the effects of a computer-based intervention on ELL students' reading performance. Participants included 813 students in the experimental condition and 677 students in the control condition across 28 schools. The independent variable in this research was a computer-based software program known as Imagine Learning. This software is intended to be used 4-5 times per week, 20 minutes per session. This intervention was implemented during the fall, winter, and spring terms. The dependent variable was students' reading performance. This was measured using a standardized assessment known as the Scantron Reading Foundations which assessed students' phonological awareness, phonics, vocabulary, and text comprehension.

According to standardized assessment results, kindergarten and first-grade students in the experimental condition demonstrated small, but statistically significant benefits compared to matched peers in the control condition across phonological awareness, phonics, vocabulary, and text comprehension.

Johnston et al. (2018) examined the effects of blended intervention including vocabulary instruction and reading fluency on ELLs reading comprehension. This alternating-treatments research included 4 ELL students, 2 third graders and 2 fifth graders.

The independent variable was a blended, multi-component intervention comprised of vocabulary instruction training and reading fluency (Johnston et al., 2018). Students received 15 intervention sessions that lasted about 35 minutes, twice a week. The

intervention consisted of three, alternating conditions: fluency-only, fluency + word definitions, and fluency + vocabulary processing questions. Students were provided a repeated reading with modeling intervention to build fluency in the 'fluency-only' condition. Students were presented a vocabulary word, provided a simple definition, used it in a sentence, and provided the repeated reading with modeling intervention in the 'fluency + word definition' condition. There were multiple steps within the 'fluency-building + vocabulary processing questions' condition. Students were provided target words as they appeared in oral reading fluency passages and had each word explained using a simple definition. Then students were provided another example of the target word within a sentence unrelated to the previous story. Then, three forced choice questions were asked to increase students' comprehension of each word followed by having students repeat the word and its meaning.

The dependent variable was students' reading comprehension, although their vocabulary knowledge and reading fluency were also assessed as a part of the study. Researchers used standardized assessment subtests, CBMs, and open-ended reading comprehension probes to measure reading fluency, reading comprehension, and baseline knowledge for English vocabulary.

Results showed limited improvement across ELL students' reading comprehension across all three conditions. Although researchers acknowledged limitations within the study, this examination indicates that adding vocabulary instruction to individual reading interventions may be an ineffective method of increasing ELL students' reading comprehension.

Research by Barber et al. (2018) examined the effects of a novel, culturally relevant computer program on ELL students reading fluency and comprehension. Participants in this study included three ELL first-grade participants of Somali background.

The independent variable was a repeated reading intervention delivered through a computer program known as Reading RACES (Relevant and Culturally Engaging Stories). The program had a variety of features, including the ability to prompt students to listen to audio, instruct students to read, listen to students as they read independently, define unknown words, and the ability to calculate the total number of words read in one minute. This allowed the computer, with help from researchers, to calculate the number of words read correctly per minute. The dependent variables included students' reading fluency and comprehension as measured by various CBMs. After collecting baseline data, students began the intervention process which involved participating in 1 to 4 sessions a week, each session lasting 20 to 30 minutes. This within-group intervention lasted 7 to 11 weeks.

Results showed increases in students' reading fluency and reading comprehension. Two out of three students showed medium to large effect sizes for reading fluency and comprehension. This research lends support to the use of a repeated reading intervention delivered through computer software to increase young ELL students' reading fluency and comprehension.

Discussion

A systematic review of the literature shows which reading components were targeted during interventions designed to increase students' reading skills, their native languages, their grade level when receiving treatment, and intervention effectiveness. Table 1 displays targeted reading components, native language, and participant grade level.

The reviewed studies revealed how fundamental the five components of reading are to the development of ELL students' ability to read. At least one of the five components was targeted across all twelve studies, with 11 out of 12 studies showing increases in ELL students' reading skills. Only one study included something outside of the five pillars, research by Goodwin et al. (2013). This research examined the association between morphological awareness and students' reading comprehension. Even though morphological awareness is not one of the fundamental components of reading according to the National Reading Panel, results still showed an indirect increase to students' reading comprehension by increasing their vocabulary skills.

According to table 1, seven out of twelve studies included ELL participants whose native language was exclusively Spanish. Two out of nine studies included participants whose native language was either Spanish, Hmong, Creole, Arabic, Chinese, Greek, or another language. Of the remaining three articles, one did not include students' native language and the other two studies included participants whose native language was Vietnamese, Tagalog, Cantonese, or Somalian. Participants' native language was not a variable that interfered with students' reading skills, based on research that demonstrated increases in reading achievement across participants with different native

languages and research demonstrating increases in reading skills across students with native languages other than Spanish.

It was not surprising that all the articles focused on students in elementary school. This is a critical time for ELL students in which they are taught reading using instruction based on the five essential components of reading. The early components of reading are foundational, making subsequent components more difficult to learn if older ELL students have missed out on previous instruction. Unfortunately, this sometimes occurs when older ELL students come to our schools speaking a different native language than English. Therefore, it is necessary to individualize instruction and interventions to students' current progress based on the essential components of reading.

Of the 12 articles, two research articles demonstrated either non-significant results between reading interventions and students' reading achievement or limitations that hindered results.

Research by Burns et al. (2017) yielded non-significant results because they were examining the association between a specific English language proficiency measure and increases in ELL students' reading achievement post-intervention. They concluded that the specific English language proficiency measure used in their study was not an accurate tool to measure students' reading growth. Instead, researchers supported the use of CBMs and subtests from standardized assessments because they were more valid measures of reading growth.

Johnston et al. (2018) presented reading intervention research that yielded non-significant to small effectiveness on students' reading growth, however, results were

impeded due to participant characteristics, inconsistencies in study design and intervention components.

Although this study focused on three of the five essential reading components, results still indicated a lack of effectiveness. Researchers explained that the first limitation, participant characteristics, began with a lack of information. Although the four participants met the criteria to be considered ELL according to BC Ministry of Education criteria, that criterion information was never revealed. The lack of transparency resulted in two participants whose receptive vocabulary was in the Average range according to pre-intervention, baseline assessments. The other two participants' receptive vocabulary skills were in the below average range. Researchers emphasize that an ELL label alone does not mean a student is at the novice or apprentice level. Instead, English language skills vary widely among this population.

The second limitation includes inconsistencies in study design and intervention components. More specifically, students in the experimental condition received limited exposure to vocabulary words taught during instruction. These students were exposed to novel vocabulary words too frequently, preventing review across multiple sessions. Although this study showed inconsistent results, it adds to a body of literature examining blending vocabulary instruction with reading comprehension interventions, which also demonstrate inconsistencies across studies.

Implications

There are a variety of effective reading interventions that increase ELL students' reading skills across elementary grade levels. The common theme among these interventions is that they target one or more of the foundational components of reading

instruction. Participants' native language did not interfere with increases in students' reading skills. Eleven out of 12 research studies indicated small, moderate, or large increases to students reading skills. Johnston et al. (2018) stated that their mixed results may have been due to inconsistencies in study design, intervention components, and participant characteristics.

Limitations

While 12 articles met inclusionary criteria for this review, many of the studies have not yet been replicated or may have lacked the rigor necessary to consider an intervention to be evidence-based. This review included a pilot study (Castro-Olivo et al., 2017) and a preliminary study (Johnston et al., 2018). It is unclear whether these two studies went through the same rigorous procedures that the other research studies went through. Additionally, this review excluded articles that were conducted or published outside of the United States. It may be that students who are developing a second language may face similar issues in schools, regardless of the country of education. It is possible to consider some essential elements of these studies to further review the findings on reading interventions for English Language Learners, or just for students who are learning a second, non-native language.

Future Directions

All of these articles focused on students in elementary school. However, ELL students begin school outside of these early grades as well, such as middle and high school. It can be unclear how much reading instruction students from this population have received or how familiar they are with the five foundational components of reading. Future research should focus on the percentage of older ELL students who struggle with

reading, their familiarity with the five components of reading, what reading interventions are used and their effectiveness.

References

Amendum, S. J., Bratsch-Hines, M., & Vernon-Feagans, L. (2017). Investigating the efficacy of a web-based early reading and professional development intervention for young English learners. *Reading Research Quarterly, 53*(2), 155-174.

Barber, M., Cartledge, G., Council III, M., Konrad, M., Gardner, R., & Telesman, A. O. (2018). The effects of computer-assisted culturally relevant repeated readings on English learners' fluency and comprehension. *Learning Disabilities: A Contemporary Journal*, *16*(2), 205-229.

Burns, M. K., Frederick, A., Helman, L., Pulles, S. M., McComas, J. J., & Aguilar, L. (2017). Relationship between language proficiency and growth during reading interventions. *The Journal of Educational Research, 110*(6), 581-588.

Cassady, J. C., Smith, L. L., & Thomas, C. L. (2018). Supporting emergent literacy for English language learners with computer-assisted instruction. *Journal of Research in Reading, 41*(2), 350-369.

Castro-Olivo, S., Preciado, J., Le, L., Marciante, M., & Garcia, M. (2017). The effects of culturally adapted version of *First Steps to Success* for Latino English language learners: Preliminary pilot study. *Psychology in the Schools*, *55*, 36-49. https://doi.org/10.1002/pits.22092

Cruz de Quiros, A. M., Lara-Alecio, R., Tong, F., & Irby, B. J. (2012). The effect of a structured story reading intervention, story retelling and higher order thinking for English language and literacy acquisition. *Journal of Research in Reading, 35*(1), 87-113.

Fien, H., Smith, J. M., Baker, S. K., Chaparro, E., Baker, D. L., & Preciado, J. A. (2011). Including English learners in a multitiered approach to early reading instruction and intervention. *Assessment for Effective Intervention, 36*(3), 243-157.

Fuchs, D., Mock, D., Morgan, P. L., & Young, C. L. (2003). Responsiveness-to-intervention: Definitions, evidence, and implications for the learning disabilities construct. *Learning Disabilities Research and Practice, 18,* 151–171.

Goodwin, A. P., Huggins, A. C., Carlo, M. S., August, D., & Calderon, M. (2012). Minding morphology: How morphological awareness relates to reading for English language learners. *Reading & Writing, 26,* 1387-1415.

Johnston, L. E., Mercer, S. H., & Geres-Smith, R. (2018). Incorporating vocabulary instruction in individual reading fluency interventions with English language learners. *Canadian Journal of School Psychology, 33*(1), 63-81.

Kovarski, C., Caucher, C., Orssaud, C., Carlu, C., & Portalier, S. (2015). *Effect of visual impairments on academic performance.* Vision Impact Institute.

Lugo-Neris, M. J., Jackson, C. W., & Goldstein, H. (2010). Facilitating vocabulary acquisition of young English language learners. *Language, Speech, and Hearing Services in Schools, 41,* 314-327.

Moats, L., & Tolman, C. (2009). Excerpted from *Language Essentials for Teachers of Reading and Spelling (LETRS)*: The Challenge of Learning to Read (Module 1). Boston: Sopris West.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS medicine*, *6*(7).

National Association of School Psychologists. (2015). *The Provision of School Psychological Services to Bilingual Students.* NASP Online. https://www.nasponline.org/resources-and-publications/resources-and-podcasts/diversity-and-social-justice/cultural-competence/bilingual-school-psychology-certification

National Center for Education Statistics. (2017). *Fast Facts: English Language Learners.* Institute of Education Sciences. https://nces.ed.gov/fastfacts/display.asp?id=96

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* Washington, D.C.: National Institute of Child Health and Human Development, National Institutes of Health.

O'Connor, R. E., Bocian, K. M., Sanchez, V., & Beach, K. D. (2014). Access to a responsiveness to intervention model: Does beginning intervention in kindergarten matter? *Journal of Learning Disabilities*, *47*(4), 307-328.

The Nations Report Card. (2019). *NAEP reading assessment: Highlights.* The Nations Report Card. https://www.nationsreportcard.gov/highlights/reading/2019/

Reading is Fundamental. (2019). *Literacy network: The issue.* https://www.rif.org/literacynetwork/the-issue

Ross, S. G., & Begeny, J. C. (2011). Improving Latino, English language learners' reading fluency: The effects of small-group and one-on-one intervention. *Psychology in the Schools, 48*(6), 604-618.

RTI Action Network. (n.d.). *What is RTI?* A Program of the National Center for Learning Disabilities. http://www.rtinetwork.org/learn/what/whatisrti

Spear-Swerling, L. (2015). Common types of reading problems and how to help children who have them. *The Reading Teacher, 69(5),* 513-522. *doi:10.1002/trtr.1410*

Tong, F., Lara-Alecio, R., Irby, B. J., & Koch, J. (2014). Integrating Literacy and science for English language learners: From learning-to-read to reading-to-learn. *The Journal of Educational Research, 107,* 410-426.

Victory, J. (2020) *How hearing loss affects school performance.* Healthy hearing. https://www.healthyhearing.com/report/52433-How-hearing-loss-affects-school-performance#:~:text=Untreated%20hearing%20loss%20causes%20delays,resulting%20i n%20poor%20school%20performance