Evaluation and Comparison of Two Variations of Repeated Reading Interventions

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Amber Shuster

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Abstract

While repeated reading is a commonly used intervention in schools, research providing clear operationalization of repeated reading administration is lacking. In the current study, data were collected from 10 elementary school students to determine if there are any differences between two variations of a repeated reading intervention. In condition one (RR1), participants were asked to read a 150-word passage three times. In condition two (RR2), participants were asked to read three 50-word sections of a 150-word twice, then read the whole passage once. Researchers collected data on the length of time required for each intervention and oral reading fluency, calculated by words correct per minute (WCPM). Results demonstrated no significant differences between the two variations of the intervention or differences between the pre-intervention WCPM to Intervention WCPM for both conditions. Results showed differences between the change in WCPM from pre-intervention to maintenance WCPM for both RR1 and RR2. RR1 was found to require less total intervention time than RR2 across all participants. Implications and future applications of repeated reading interventions are discussed.

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Chapter I

Literature Review

A significant portion of a child's early education is focused on learning the skills needed to become a good reader. Educators are motivated to effectively teach these reading skills, which provides a foundation for a student's academic career. Students who do not develop strong reading skills will have difficulties in many areas, such as reduced performance in other academic skills, decreased motivation to learn, poor self-esteem, and negative long-term outcomes (Boyes et al., 2018; Regis College, 2023). It is essential that students who are having difficulty learning to read are identified early and are provided with interventions that can increase their reading accuracy and fluency. As we provide interventions to students, it is important to ensure the interventions are evidence-based and effective for a diverse set of students. For this study, the prevalence of reading concerns, the science of teaching reading, and interventions that target reading concerns will be examined. In particular, this project will focus on one intervention, repeated readings, and will examine the impact of two variations of a repeated reading intervention.

Defining Reading Problems

Reading is an academic skill that is important for students to acquire for successful performance in the academic setting and in day-to-day life. Yet, learning to read is difficult and reading problems plague many students across the United States. The 2022 report of The Nation's Report Card revealed that 37% of fourth-grade students and 30% of eighth-grade students in the U.S. performed below the "Basic" skill level required for reading at their grade (National Center for Education Statistics [NCES], 2022). Student performance on this evaluation

has not changed significantly since 1992, when these data were first collected, substantiating the continued reading problems experienced by many children in the United States.

Reading problems are associated with several long-term effects that negatively impact several areas of functioning for an individual, such as lower self-esteem, increased externalizing problems, and increased internalizing problems (Arnold et al., 2005; Boyes et al., 2018; Carroll et al., 2005). Externalizing problems associated with reading difficulties for school-aged children include attention problems, conduct problems, delinquency, aggression, and oppositional defiant disorder. Internalizing problems associated with reading difficulties include increased depression, anxiety, and somatic symptoms. Studies show that students who struggle with reading early on continue to struggle with reading throughout their academic career (Torgesen, 2000).

Poor reading skills can continue to hinder children as they become adults. Illiteracy is related to negative individual outcomes that impact society as a whole. Illiterate adults make up 75% of the unemployed, 33% of mothers receiving aid, 60% of prison inmates, and 85% of juveniles who appear in court (Fiala & Sheridan, 2003). Research clearly indicates that developing adequate reading skills is important for not only academic success but is important for positive life outcomes. With large numbers of students experiencing reading difficulties, it is important for educators to understand effective reading instruction and to intervene early to mitigate these challenges.

Science of Reading

Reading has been viewed as a critical skill for decades; however, researchers continue to debate the approach to reading instruction, deliberating between phonics-based instruction and whole-language instruction approaches. Those arguing for a whole-language approach to reading

instruction emphasize teaching children to identify words through contextual factors, while those arguing for a phonics-based approach to reading instruction focus on teaching individual sounds of letters and letter combinations. This study will follow the science of reading framework, which began with the Information Processing Model.

Information Processing Model

In 1974, LaBerge and Samuels introduced a model to describe the components they believed to be involved in transcribing written stimuli into meaningful information; they named this model the Information Processing Model or IPM. This model involved four systems through which information was processed. When read information is processed well and learned, it will result in accurate and automatic reading for an individual. The first system involved in the IPM is the visual processing of information. Next, the information will pass through the phonological and episodic memory systems. Finally, it is processed in the semantic system, where comprehension will occur. It is assumed that processing through these stages can be learned and is measured through accuracy and automaticity. The IPM suggests that fluent readers have the ability to decode text automatically, which frees up an individual's attention so that the text can be comprehended. Many current theories have been based on this 1974 IPM model.

The Big 5

With many students struggling with reading and the negative outcomes associated with poor reading and illiteracy, researchers began to thoroughly examine the science of teaching reading. In 1997, congress appointed a National Reading Panel (NRP) to determine effective and evidence-based practices for teaching reading. The NRP determined that there are five big components to developing effective reading skills, which include phonemic awareness, phonics, fluency, vocabulary, and comprehension (National Institute of Child Health and Human

Development, 2000). Phonemic awareness is the ability to focus on and manipulate phonemes in spoken words (Ehri et al., 2001; Liberman et al., 1974; National Institute of Child Health and Human Development, 2000). Phonics relates to educating students on how to use grapheme-phoneme correspondences to decode or spell words. Reading fluency refers to a person's ability to read accurately, quickly, with good prosody, and little effort (Nieporent, 2021). Vocabulary is defined as the lexical and semantic representations of word meanings (Ouellette, 2006). In other words, vocabulary is the understanding of word meaning, which is correlated and implicated in comprehension, or the understanding of the meaning of a text. The results of the report implicated these five areas in the success or failure of reading development for children.

In addition to the identification of these critical areas, the Panel discussed several instructional strategies that can be used to teach the skills needed to read. These instructional recommendations included: direct instruction in phonemic awareness and phonics; oral reading instruction; explicit and implicit learning of vocabulary; and improving comprehension through the explicit teaching of recall strategies. These strategies integrate the instructional methods that are addressed in The Simple View of Reading, an empirically supported model of reading instruction.

The Simple View of Reading

The basis of The Simple View of Reading is represented in a mathematical equation, Reading Comprehension (RC) = Language Comprehension X Decoding, suggesting that reading comprehension is the product of language comprehension skills and decoding skills (Gough & Tunmer, 1986; Nation, 2019). The first component of this model is decoding, which is the ability to break down letter-sound relationships to correctly read and pronounce words. This skill often is targeted early in the development of reading skills. The next component is language

comprehension skills, or the ability to understand the meaning of written or spoken words and sentences. The Simple View of Reading proposes that when both of these skills are adequately developed, we are then able to successfully comprehend what we read (Gough & Tunmer, 1986; Nation, 2019).

As previously discussed, one way to teach these skills is through direct and explicit instruction (Engelmann et al, 1988; Lombardi, 2019; National Institute for Direct Instruction. (n.d.); Panel, 2000). Direction instruction includes five components that are linked to its effectiveness: 1) carefully designed curriculum; 2) increased teaching time; 3) efficient teaching techniques; 4) thorough implementation procedures; and 5) increased teacher expectations (Engelmann et al, 1988). Direct instruction practices have been used in the classroom for decades and incorporate explicit instruction that uses modeling, practice, and feedback to teach new skills (Lombardi, 2019).

Modeling involves a skilled individual demonstrating a skill or strategy in the actual context in which the skill or strategy will be used (Lombardi, 2019; Methe & Hintze, 2003; Regan & Berkely, 2012; Rupley et al., 2009). Teachers may use modeling as a way to assist students in conceptualizing and applying various reading skills and strategies (Rupley et al., 2009). For example, a teacher may read a section of a passage to students to demonstrate the skills and vocabulary needed to read the passage. Additionally, the teacher may demonstrate the use of different strategies to help the student, such as decoding an unknown word. Exposure to a task before being asked to complete it independently allows the student to see and hear how to read something with correct pronunciation, rate, and intonation. Modeling should be specific, flexible, and explicit to best benefit students (Regan & Berkely, 2012). Once students have observed a modeled skill, they can begin practicing.

When learning a new skill, including reading, it is important that students repeatedly practice completing the skill accurately. Archer and Hughes (2010) address two types of practice that should be used in explicit and systematic instruction: 1) guided practice and 2) independent practice. Guided practice requires a high frequency of responses, ensures high rates of success, provides prompts and feedback, and requires practice until the student is fluent (Archer & Hughes, 2010; Lombardi, 2019). Independent practice should include monitoring of initial attempts and should be continued until automaticity is achieved. Both types of practice are helpful in allowing the student opportunities to practice a skill through repeated trials. When developing reading and memorization skills, practice is a useful way to help a student learn the correct responses and develop skill automaticity. For example, using sight word flashcards to practice sight words has been shown to improve accuracy and fluency in reading (Fraher et al., 2019). Repeated practice in reading has been found to be effective in improving the reading skills of students with reading difficulties, as well as other disabilities, such as intellectual or developmental disabilities (Fraher et al., 2019; McLaughlin et al., 2015; Stevens & Burns, 2021). To ensure that practice leads to fluency and automaticity, feedback is necessary.

Feedback is an integral part of direct instruction. To ensure that a student is performing a skill correctly, appropriate and constructive feedback is necessary. Research indicates four main components of effective feedback: appropriate timing of feedback, the amount of feedback, the mode of delivery, and the audience of the feedback (Brookhart, 2008). When deciding on the content to include in feedback, there are several aspects to be considered, including focus, comparison, function, valence, clarity, specificity, and tone (Brookhart, 2008). For the purpose of this study, we will use immediate corrective feedback and will incorporate some of the above aspects when delivering feedback.

There are many different elements to be considered when developing effective reading practices. Integration of these elements will help foster a positive learning experience, especially for children who are struggling to grasp these concepts. Although there are many components that are important for developing reading skills, we will focus on reading fluency (i.e., reading rate and accuracy) for the purpose of this study.

Reading Fluency

As discussed above, reading fluency has been identified as a critical component of effective reading instruction and is necessary for a student to become a successful reader (Panel, 2000). Reading fluency refers to an individual's ability to read quickly, smoothly, accurately, and with expression (Nieporent, 2021). Fluent readers can recognize words automatically without decoding issues, which is necessary for connecting word recognition and comprehension. The purpose of reading is to adequately comprehend and learn from what one is reading. Reading fluency and comprehension are related concepts, and to develop effective comprehension skills, one must be able to read fluently. Thus, developing adequate reading fluency skills is important for the development of good readers as this will directly influence a child's comprehensive reading skills.

There are many evidence-based interventions that can be used to improve reading fluency (reading rate and accuracy) that utilize components of effective instruction and fit within the models discussed in the science of reading. Some common evidence-based reading interventions used to target reading fluency include Listening Passage Preview, Paired Reading, Error Correction (e.g., Word or Phrase Drill), and Repeated Reading. These interventions have a vast body of research to support their effectiveness; however, for the purpose of this study, we will focus on Repeated Reading.

Repeated Reading Intervention

A commonly used intervention for reading difficulties is known as Repeated Reading (RR). RR is a reading intervention that uses practice and feedback to help a student read a passage more fluently. Samuels (1979) proposed three primary goals of a RR intervention: 1) increase reading speed, 2) transfer the improvement in speed to future material, and 3) increase comprehension with each subsequent rereading of the text. Generally, RR is administered by having the student read a passage aloud while a fluent reader listens and provides immediate corrective feedback, where the student is given the correct pronunciation, then continues reading. After the student has read the passage, the student will attempt to read the passage again but faster and more accurately. The student will repeat this process two to four times, or until a certain fluency criterion is met (Wexler et al. 2008).

RR interventions were conceptualized in the 1970s by S. Jay Samuels and Patricia Dahl (Dahl, 1975; Samuels, 1979). The literature has grown since then, supporting the use of RR interventions to improve oral reading fluency (Herman, 1985; Meyer & Felton, 1999; Chard et al., 2002; Rasinski et al., 2021). An early synthesis of research conducted by Meyer and Felton (1999) revealed the answer to many practical questions asked about RR interventions, such as can reading speed be improved by RR, which types of RR interventions are most effective, and what factors of RR help transfer the improvements to novel texts. Meyer and Felton (1999) found many research studies supporting RR as an effective means of improving reading speed in elementary school-aged students. However, many variations of RR were identified.

The “basic method” and three variations of RR interventions were reviewed: 1) assisted; 2) unassisted; and 3) prosodic reading. The basic method was described as a student reading a passage at instructional level aloud several times until a desired reading rate was obtained.

Assisted RR included a student reading aloud and along with a fluent reader (spoken or modeled text). Unassisted RR involved a student reading and rereading a passage silently by themselves. Prosodic reading involved the model reading the passage with expression while having the child listen to the model read it aloud several times or having the reader co-read with the model. Meyer and Felton (1999) found that these different variations of RR interventions had varying effectiveness for students with different reading levels. Prosodic reading was found to be better for beginning readers, while all types of RR were helpful for readers with average skills (Dowhower, 1987; Meyer & Felton, 1999). Overall, this synthesis concluded RR to be an effective intervention for improving oral reading fluency for students.

Information has been provided to assist individuals in deciding whether and how to implement RR intervention (Therrien & Kubina, 2006). The first step in deciding whether to use RR was described as determining if the students have the necessary prerequisite skills, which excludes individuals who read below a first-grade instructional level or who have not acquired basic reading skills. Next, choosing an appropriate format for the intervention is recommended (e.g., peer-tutoring, teachers). Three essential instructional components are outlined for effective RR interventions including the passages being read aloud to a competent reader, providing corrective feedback, and reading a passage until a set performance criterion is reached (Therrien & Kubina, 2006). Materials required were described as instructional-level reading passages, a timer, and data-tracking sheets.

In addition to being helpful for students with average reading skills, RR interventions have a large body of research examining the effectiveness of using repetition as a strategy to improve reading skills, and specifically reading fluency, in struggling readers (Chard et al., 2002; Homan et al., 1993; Kim et al., 2017; Lee & Yoon, 2017; Therrien, 2004). An early article by

Chard et al. (2002) synthesized the research on interventions designed to build reading fluency skills for students with learning disabilities. Their synthesis yielded 24 research articles from 1975 to 2000 that examined interventions that targeted elementary-aged students who had been identified with a learning disability and reading fluency concerns. The results of the synthesis indicated that RR interventions for students with learning disabilities were associated with increased reading rate, accuracy, and comprehension, with increased effectiveness for RR interventions with a model when compared to interventions without a model (Chard et al., 2002).

A more recent synthesis conducted by Kim et al (2017) replicated these findings with articles published between 2004 and 2014. This synthesis resulted in 12 studies that met their inclusion criteria. This examination used a much more stringent selection process than the synthesis completed by Chard et al. (2002), yet the results remained similar. RR interventions were effective in improving oral reading fluency for students with learning disabilities. Unlike Chard et al (2002), this synthesis found no difference between the effectiveness of RR interventions with a model versus without a model.

In addition to improvements in fluency, there is some research supporting the improvement of reading comprehension through improved fluency (Homan et al., 1993). Homan et al (1993) found significant comprehension improvement for sixth-grade students who completed a repeated reading intervention over the course of seven weeks. A more recent study completed by Strickland et al (2013) found similar results, suggesting that RR is an effective intervention for improving reading comprehension in addition to fluency. However, it should be noted that only minor to moderate improvements in comprehension were found for novel passages (Strickland et al., 2013). Based on this review of current research, RR interventions have been implemented in a variety of ways for decades. Many variations of administration exist,

such as the number of repetitions, add-on components, and passage length, which will be discussed in more detail below.

Adaptations to Repeated Reading Interventions

Passage Repetition

Researchers have examined modifications to RR interventions to identify the number of times to repeat the reading of a passage. In a synthesis by Meyer and Felton (1999), this question was addressed and determined that 3 to 4 readings of the passage resulted in the largest improvements in reading fluency. No significant increase in gains were found when reading a passage more than 4 times or when reading a passage less than 3 times. A meta-analysis completed by Therrien (2004) found similar results. Therrien (2004) examined the effect sizes of mean fluency and mean comprehension rates after reading a passage two, three, or four times. The largest effect size for fluency was found when the passage was read four times. However, there was not a significant difference between the third read (ES = 0.85) and the fourth read (ES = 0.95) but both the third and fourth read were significantly different from the second read (ES = 0.57) (Therrien, 2004). A more recent study by Lee & Yoon (2017) found that four repetitions of the passage resulted in statistically significant differences in gains when compared to two and three repetitions. All three articles support the hypothesis that the ideal number of readings of a passage is between three and four times.

Add-On Components

RR interventions have been combined with a variety of other interventions, including 1) word preview, 2) listen passage preview, 3) error correction, 4) performance feedback, and 5) peer-mediated reading (Lee & Yoon, 2017; Wu et al., 2019). Word preview involves pre-teaching the pronunciation and meaning of keywords in a text prior to the student reading the

text. Listen passage preview has an advanced reader read a passage while the student silently follows along with the advanced reader. Error correction procedures can take many forms, such as word drill, sentence drill, phrase drill, and segmenting and blending. Performance feedback involves providing rewards contingent on meeting fluency goals and for appropriate behaviors (e.g., paying attention, finishing assigned work, and compliance). Peer-mediated reading includes peers as tutors or partner reading to improve a struggling student's reading skills. Peer-mediated reading can occur in partner reading, small-group reading, or multiple-grouping formats.

There is a plethora of research evaluating RR interventions combined with these add-on components. A meta-analysis by Lee and Yoon (2017) evaluated the effects of each of the above add-on components as well as student reading level and generalization effects. Results indicated that the RR intervention was more effective for elementary students compared to secondary students. No statistically significant differences were found when RR intervention with no add-on components was compared to RR intervention with word preview, RR with systematic error correction, RR with performance feedback, and RR with peer-mediated reading. RR intervention with listen passage preview was found to be significantly better statistically than RR intervention alone (Lee & Yoon, 2017). Wu et al. (2019) examined the effects of a multi-component reading intervention that combined all of the above add-on components except for peer mediation. The results of this study demonstrated improvement in oral reading fluency for all participants. The results of these meta-analyses demonstrated that RR alone tends to be as effective as RR with a single add-on component; however, adding multiple components increases effectiveness and more gains in oral reading fluency are seen than when using RR alone.

Passage Length

Samuels' (1979) original proposal of RR procedures stated that passages should be approximately 50-200 words. What Works Clearinghouse's recommendation is consistent with Samuels' original proposal, while Intervention Central suggests a passage be between 100 and 200 words (Intervention Central, n.d.; What Works Clearinghouse, n.d.). In addition, an article by Therrien and Kubina (2006) described instructional level passages as passages between 100 and 200 words. To evaluate these recommendations, Bastug and Keskin (2014) compared RR procedures using 100- and 200-word texts to compare differences in reading rate and reading accuracy. Results of this study indicated gains for both groups in both reading rate and reading accuracy. However, a significantly larger increase in reading rate and reading accuracy were observed in the group that read the shorter (100-word) passage. A limitation of this study is unclear methodology in the published article (i.e., brief description of methods); however, the results are consistent with past research examining massed versus distributive practices in learning.

Massed practice refers to a large amount of material being presented repeatedly within a short period of time while distributed practice refers to a schedule of practice and engagement with material over a period of time and multiple sessions (Sayeski et al., 2017). Research supports distributive learning practices as more effective than massed learning practices. When thinking about passage length, it is important to consider the optimal distribution level of work. There is no published research exploring the effectiveness of a modification that breaks the passage into sections and repeats sections rather than the whole passage. The basis of our work is rooted in the concept that practicing a passage in shorter chunks will be more beneficial for the reader.

Gaps in Research

Evaluating RR research can be difficult as most studies implement RR interventions with some variation, and no clear operationalization of procedures has been defined. Most research finds RR interventions to be an effective way to improve reading fluency; however, some research suggests that many studies evaluating RR interventions may not be methodologically rigorous (Chard et al., 2009; Naveenkumar et al., 2021).

A study conducted by Chard et al (2009) examined the quality of research methods and impact of study outcomes to determine if RR interventions were effective for improving reading fluency for students with or at risk of learning disabilities. In addition, a secondary goal was to determine if RR could be considered an evidence-based intervention. Using criteria from Horner et al. (2005) and Gersten et al. (2005), a quality indicator rubric was created to rate articles and determine the quality of the studies being used to determine if this intervention was evidence-based.

To determine if RR intervention for students with or at risk for a learning disability was evidence-based, the following criteria were assessed for single-subject research: a) five studies that meet minimally acceptable methodological criteria documenting positive effects from the practice; b) the studies needed to be conducted by three different researchers from three different regions of the country; c) must have a minimum of 20 subjects across the studies. When examining the quality indicators of the single-subject research designs, the following areas were assessed: 1) participant/setting; 2) dependent variable(s); 3) independent variable; 4) baseline; 5) experimental control/internal validity; 6) external validity; and 7) social validity. For experimental or quasi-experimental research, the following criteria must be met: a) must have four acceptable quality (1-4 desirable quality indicators) or two high-quality (meet all but one

essential quality indicators) demonstrating effectiveness of the practice; b) weighted effect size significantly greater than 0. When examining the quality indicators of experimental or quasi-experimental designs, the following areas were assessed: 1) description of participants; 2) intervention/comparison conditions; 3) outcome measures; and 4) data analysis.

The results of this review did not identify enough research studies that met the above criteria, thus not having enough support to label RR interventions as an evidence-based practice for students with or at-risk for learning disabilities. When reviewing the six single-subject design research articles, 1/6 met the quality standards for description of participants/setting, 5/6 met the quality standards for dependent variable description, 2/6 met the quality standards for independent variable description, 3/6 met the quality standards for baseline procedures, 4/6 met quality standards for experimental control/internal validity, 0/6 met quality standards for external validity, and 6/6 met quality standards for social validity. When reviewing the experimental and quasi-experimental design research articles, 1/6 met quality standards for description of participants, 1/6 met quality standards for intervention/comparison conditions, 2/6 met quality standards for outcome measures, and 1/6 met quality standards for data analysis.

Other recent researchers have confirmed the findings of Chard et al (2009). A systematic review completed by O'Keeffe et al (2012) examined the quality of RR intervention research across populations beyond students with or at-risk for a learning disability. Results of this review were consistent with Chard's research determining that RR does not have enough high-quality research to be considered an empirically supported treatment. A systematic review completed by Naveenkumar et al (2021) examined the rigor of the studies completed to review reading fluency interventions. Results of this review were consistent with the results of Chard et al. and O'Keeffe et al., suggesting that research completed for RR interventions does not meet the scientific rigor

needed to be considered an evidence-based practice. Despite a large body of research exploring various administration procedures, research providing clear operationalization of RR administration is lacking.

While it is clear that there is inconsistent research support for RR interventions, other concerns have to do with the length of the intervention time and unclear implementation procedures. Research regarding the length of intervention varies greatly, with some studies noting the length of time or setting a time limit, such as 10-15 minutes, while others did not note the length of time required to implement this intervention. Several of the articles reviewed either did not include explicit methodology on how the RR intervention was implemented or it was implemented in various ways that were not consistent across research. For example, the number of repetitions, length of the passage, or procedural steps were not outlined within the published papers. Identification of most effective implementation procedures for RR intervention will allow further high-quality research to be conducted to determine if RR can be considered an evidence-based practice.

Statement of the Problem

According to the literature, reading proficiency is linked to academic, emotional, and general life outcomes, and can be improved with effective instruction and intervention (Arnold et al., 2005; Boyes et al., 2018; Carroll et al., 2005). Although RR interventions have long been used to target reading fluency, there is no clear instruction or research on the most effective way in which RR interventions should be implemented. For interventions to be most effective, they must be implemented with fidelity (Abry et al., 2015; Fixsen et al., 2013). However, executing an intervention when there is a lack of empirically defined procedures can lead to poor implementation and confusion regarding best practices. There is a clear need to evaluate the

different ways in which an RR intervention might be implemented to determine any differential reading gains, as well as to provide clear instructions on best practices of implementation of this intervention.

This study will examine two variations of a RR intervention. Using a within-subjects group design, elementary school students will be exposed to both conditions (i.e., RR1 and RR2). The primary difference in the two conditions is the length of the section being read when completing RR procedures (i.e., RR1 students will read a whole passage versus RR2 with students reading 50-word sections). Student reading outcomes, time of administration, and maintenance of skills will be measured using Dynamic Indicators of Basic Early Literacy Skills (DIBELS; University of Oregon, n.d.) and comparisons will be made across student reading skill level (i.e., at instructional level readers and below instructional level readers). This research will attempt to begin to identify the most effective implementation of RR. In service of that goal, the following research questions will be addressed:

1. Are there differences in oral reading fluency when using RR1 versus RR2? Previous research suggests that greater improvement in oral reading fluency has been found in shorter reading passages (Bastug and Keskin, 2014). Thus, we hypothesized that greater improvement in oral reading fluency, as measured by words correct per minute (WCPM), would be observed in RR2 versus RR1.
2. Are there any differences in length of time required to implement RR1 versus RR2, as measured by the total time required? Research does not inform this question, but personal experience was used to hypothesize that RR2 will take a longer amount of time.
3. Are there any differences in oral reading fluency changes for different level readers? Previous research suggests that RR procedures with modeled reading were better for

students who read under 45 WCPM. However, RR without modeling was found to be just as effective as RR with modeling for students who read over 45 WCPM (Dowhower, 1987; Meyer & Felton, 1999). Thus, we hypothesize that students at instructional level will benefit more from these interventions than students who are below instructional level.

4. Are there any differences in the maintenance of gains in RR1 versus RR2? Based on previous research, distributive learning was found to be a more effective way to teach information (Sayeski et al., 2017). Based on this, we hypothesize that increased gains in RR2 will be observed since passages will be broken down into chunks as opposed to learning a whole passage.

Chapter II

Methods

Participants

University IRB approval was obtained, and 13 students were identified and approved to participate in the study. Two of the students were excluded during the screener sessions due to behaviors and one student moved. In addition, any students who scored below the 10th percentile on the reading pre-test would have been excluded; however, none of these participants scored be the 10th percentile. Thus, data was collected for the 10 remaining students. Of the 10 students, 40 percent of the students were female, and 60 percent of the students were male. Students were in the second (n = 3), third (n = 4), and fourth grade (n = 3) and were participating in a university-assisted community school after-school program. Each child's parent was sent an informed consent form and an opt-out form to complete if they did not want their child's data to be included in this research study (see Appendix B). Each child was read an assent form and verbally agreed to participate (see Appendix C). Passive consent/assent was obtained for 10 students.

Settings and Materials

The research study took place at a high needs suburban elementary school in the southeastern united states, with a primarily minority demographic (43% African American; 33% White; 23% Hispanic; >5% Asian/Pacific Islander; and >5% American Indian), and an even number of male and female students. Approximately 47% of students were reported to be economically disadvantaged in 2022 (Tennessee Department of Education, 2022). The university-assisted community school is an after-school program where children receive additional academic support services, physical education, music, and art programs. All data (i.e.,

screener, condition one, condition two, and maintenance) were collected in the downstairs area dedicated to the afterschool program at the school.

Study materials included UTK IRB approved informed consent and opt-out form/assent forms (see Appendices B and C), screener research packets, intervention research packets, and a maintenance packet. Additional materials used each session included a pencil, a stopwatch, and stickers and cupcakes as rewards for students' participation. Screener research packets consisted of two copies of three grade level reading passages, administration scripts, treatment integrity checklists, and data collection sheets (see Appendices D and I). Intervention research packets consisted of two copies of two 150-word grade level reading passages, administration scripts for RR1 and RR2, treatment integrity checklists, data collection sheets, and a social validity questionnaire (see appendices E, F, H, I, J, K, and L). Maintenance research packets consisted of two copies of each passage read during the intervention session, administration scripts, and treatment integrity checklists (see appendices K and L).

Dependent Variables

Oral Reading Fluency and Reading Errors

To calculate oral reading fluency, Words Correct Per Minute (WCPM) was calculated. WCPM was calculated by counting the total number of words read correctly (WC) and dividing by the time (T) in seconds (WC/T = X), then multiplying by 60 (X*60 = WCPM). Errors were also recorded during each reading. Any omissions, additions, substitutions, or hesitations > 3s were counted as an error.

Intervention Time

To assess the length of time required for each intervention, researchers recorded the time needed to implement the intervention in RR1 and RR2. Researchers began recording once the

researcher began reading the intervention script until the end of their final reading for each condition. Intervention time was recorded in seconds. The difference in time it took for each participant to complete the interventions was calculated by subtracting the higher intervention length of time by the lower intervention length of time. The average difference in time was calculated by adding all the differences in time divided by the total number of participants.

Interobserver Agreement

To ensure all data collected were reliably scored, the primary researcher trained supporting researchers on procedures for scoring WCPM and recording the intervention time. Each word of the passage was marked by each scorer as correct/incorrect. Interscorer agreement for WCPM was calculated by dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100. Reliability was calculated for at least 30% of screener sessions, 30% of intervention sessions (RR1 and RR2), and 30% of maintenance sessions. Overall reliability for screener sessions was 99% (range 97-100%). Overall reliability for RR1 intervention sessions was 98.5% (range 98-100%) and reliability for RR2 intervention sessions was 99.5% (range 99-100%). Overall reliability for maintenance sessions was 99.75% (range 99-100%).

Independent Variables

The independent variables include two variations of a repeated reading intervention: RR1 and RR2. RR1 requires the student to read the same passage three times while receiving corrective feedback during each reading. RR2 requires the reader to read each section of a passage twice, then read the whole passage once, while receiving corrective feedback. Detailed information on the steps of each intervention is described in the Procedures below.

Procedures

Once IRB permission was obtained from the school district and university, students' parents were sent an informed consent form and opt-out form informing them that all children in the 2nd, 3rd, and 4th grades would be receiving a reading assessment to provide data to the school. Additionally, they were informed that we would like to use the data for research, but that they could send back the opt-out form to the school to withdraw their child's data from the study. If an opt-out form was not returned, student assent was collected. All students completed all research conditions, but only data from students whose parents did not return the opt-out form and where the student gave assent, was collected.

Researcher Training

Researchers participated in training to ensure there was integrity in all data collection procedures. All supporting researchers were students in a School Psychology Ph.D. program. During training, the primary researcher trained all supporting researchers on the administration of all relevant data collection and implementation scripts. Researchers were trained to complete all steps with integrity (100%) and to score reliably (above 90%). Researchers were trained on which type of errors to mark, including mispronunciations, substitutions, additions, and hesitations longer than three seconds. If any of these errors were made, researchers were instructed to provide the correct word for the student. If a child skipped a line, researchers were instructed to allow the student to continue reading without correction and mark the skipped line as one error.

Screening Procedures

All students took part in screening to determine their eligibility for the study. During screener administration, a trained researcher read the assent form to the student, then introduced

the study and provided directions using a researcher developed script (see Appendix D). To assess oral reading fluency, participants were asked to read three grade level passages for one minute. Passages were administered in a randomized order. Students were asked to read the passages as quickly and accurately as possible. Time and errors were recorded for each passage. Errors included mispronunciations, additions, hesitations greater than three seconds, and substitutions. Error correction was not provided during screening sessions. If a student hesitated for more than three seconds, the word was given to move the child along.

To determine a child's reading level, the median WCPM score across all three screener passages was used. Median WCPM was then compared to DIBELS 2021-2022 oral reading fluency percentile norms to determine the participants' eligibility in the project and identification of reading level (i.e., average or below average) of group for data analysis. According to McKevett and Kiss (2019), students above the 75th percentile are considered independent readers at a mastery level, students between the 25th and 75th percentile are considered to be at an instructional level, and students below the 25th percentile are considered to be at a frustrational level. For analysis purposes, students were then grouped based on their percentiles. Students included in the study were either in the at or above instructional level group (25th-99th percentile) or below instructional level group (10th-24th percentile).

Intervention

Once screening was completed and student reading levels were determined, participants were then randomly assigned to either receive RR1 or RR2 by using a random number generator to determine which condition the participant would receive first. Two grade level 150-word passages were used for intervention conditions. These two passages were examined by the researchers and determined to be as equivalent as possible (e.g., readability, unusual vocabulary,

complex phrasing) using a Lexile Range estimator. Both passages for each grade were put into the estimator and received the same ratings for measures of decoding, vocabulary, sentences, and patterns (see Appendix L). Passages were counterbalanced so that students would receive them in a randomized order, meaning that some students received passage A for RR1 and passage B for RR2 and vice versa. WCPM was calculated for the final reading of both RR1 and RR2 passages and used for analysis. Time and errors were collected for all readings across RR1 and RR2 passages. Errors included mispronunciations, additions, hesitations greater than three seconds, and substitutions. Corrective feedback was provided across all readings by giving the correct word. For example, if the participant said "was" instead of "saw," the researcher would say "saw" and point to the word where an error was made.

Condition One (RR1)

In condition one, students received RR1 intervention procedures. In RR1, the participant was given a copy of a 150-word passage (either passage A or B) to read while the researcher followed along on their copy. Participants were asked to read the whole passage three times while time and errors were recorded. Immediate error correction feedback was provided immediately when an error was made, or the participant hesitated for more than 3 seconds.

Condition Two (RR2)

In condition two, students received RR 2 intervention procedures. In RR2, the participant was given a copy of a 150-word passage that was broken into three 50-word sections by adding extra space between the paragraphs on the page (See Appendix L 4th Grade Passage B for example). Participants were asked to read each section twice while the examiner recorded time and errors. After all sections had been read twice, the participant was asked to read the whole

passage while time and errors were recorded. Immediate error correction feedback was provided when an error was made, or the participant hesitated for more than three seconds.

Maintenance

One week after completing the intervention, students reread the passages from condition one and condition two to evaluate if any gains in WCPM were maintained. Participants read the passages in a randomized order. Each passage was read once, while time and errors were recorded. Errors included mispronunciations, additions, hesitations greater than three seconds, and substitutions. Error correction was not provided during maintenance sessions. If a student hesitated for more than three seconds, the word was given to move the child along.

Treatment Integrity

To ensure that screener, intervention, and maintenance data were collected with integrity, researchers involved in data collection were trained on research procedures and received scripts to follow (see Appendices D, E, F, and H). A secondary researcher completed a treatment integrity checklist to ensure all procedures were followed with integrity (see Appendices D, G, and H) for 30% of all sessions across all conditions. Treatment integrity was calculated by taking the total number of items completed, dividing it by the total number of items on the checklist, and multiplying it by 100. Treatment integrity across screener sessions was calculated at 100%. Treatment integrity across intervention sessions was calculated at 100%. Treatment integrity across maintenance sessions was calculated at 100%.

Social Validity

At the end of the intervention session, a social validity scale was read to each child (see Appendix J). The scale contained 4 Likert-style questions on a scale of 1 (*not at all*) to 4 (*very*

much) and 3 open-ended questions. The social validity measure was given immediately after the intervention session to ensure that the different activities were fresh in the student's mind.

Data Analyses

A group design was used for this study. A repeated measures ANOVA with within and between-subject analyses, was used to examine group differences. Paired samples T-Test were used to compare change scores for screener WCPM to intervention (RR1 and RR2) WCPM and screener WCPM to maintenance (RR1 and RR2) WCPM. Analyses comparing effectiveness across readers at, or below, instructional level were conducted, as well.

Chapter III

Results

The purpose of this research study was to evaluate the effectiveness of two different variations in RR interventions and provide better guidance on the operationalization of procedures used when implementing RR interventions. RR1 intervention procedures required participants to read a 150-word passage three times. RR2 intervention required participants to read each 50-word section of a 150-word passage twice, then read the whole passage once. Analysis of research questions are described in more detail below.

Research Question One

The first research question assessed whether there were differences in oral reading fluency when using RR1 versus RR2, as measured by WCPM. This data was evaluated by completing a paired samples t-test on change scores (pre-test to post-test). Results of the t-test were not significant ($t(1,9) = .401$, $df = 9$, $p = 0.698$); thus, no statistically significant differences between changes from pre to post-test were detected for RR1 or RR2.

Research Question Two

The second research question evaluated the difference in the length of time required to implement RR1 versus RR2. This data was evaluated by comparing the RR1 total intervention time to the RR2 intervention time for each participant (see Table 1; all tables can be found in Appendix A at the end of this document). When comparing total intervention time for RR1 to the total intervention time for RR2, RR1 required less time than RR2 for all participants. The average difference in length of time to complete RR1 intervention versus RR2 intervention for participants was 77 seconds (range 11 to 169 seconds), meaning that RR1 required less time to

implement than RR2. Overall, two students were not able to complete either intervention in 10 minutes or less, and one of those two students went over 15 minutes per intervention.

Research Question Three

The third research question aimed to determine any differences in oral reading fluency changes for different level readers. Of the 10 participants, 6 (participants 1, 2, 4, 5, 7, and 10) were classified within the "At Instructional Level" group and 4 (participants 3, 6, 8, and 9) were classified within the "Below Instructional Level" group. The mean change in scores for each condition and each group is reported in Table 2. To answer this question, a two-way repeated measures analysis of variance (ANOVA) was conducted and the condition by group interaction was not significant ($F(1,8) = 3.118$, $p = 0.115$), main effect of condition was not significant ($F(1,8) = 0.007$, $p = 0.936$), and the main effect of group was not significant ($F(1,8) = 0.296$, $p = 0.601$).

Research Question Four

The final research question evaluated differences in the maintenance of gains in RR1 versus RR2. First, paired sample t-tests were run to compare post-test scores to maintenance scores for both RR1 and RR2. No significant differences were found for RR1 ($t(1,9) = -0.238$, $df = 9$, $p = 0.818$) or RR2 ($t(1,9) = -0.024$, $df = 9$, $p = 0.982$). Then, paired sample t-tests were run to compare pre-test scores to maintenance scores for both RR1 and RR2. Significant differences were found with RR1 ($t(1,9) = -3.023$, $df = 9$, $p = 0.014$) and for RR2 ($t(1,9) = -2.994$, $df = 9$, $p = 0.015$). The means for each condition are in Table 3. For both RR1 and RR2, mean WCPM increased between pre-test and maintenance. While there was no increase in mean post-test scores, significant changes occurred in maintenance scores.

Interobserver Agreement/Treatment Integrity

Interobserver Agreement (IOA) was collected and calculated for at least 30% of pre-test sessions, 30% of post-test sessions (RR1 and RR2), and 30% of maintenance sessions. The overall IOA for pre-test sessions was 99% (range 97-100%). The overall IOA for RR1 post-test sessions was 98.5% (range 98-100%) and the IOA for RR2 post-test sessions was 99.5% (range 99-100%). The overall IOA for maintenance sessions was 99.75% (range 99-100%). Treatment integrity was collected for 30% of sessions across all conditions. Treatment integrity across pre-test sessions was calculated at 100%. Treatment integrity across post-test sessions was calculated at 100%. Treatment integrity across maintenance sessions was calculated at 100%.

Acceptability

Acceptability data were collected after administration of both experimental conditions was completed (i.e., RR1 and RR2). All participants in the study completed a social validity scale consisting of 3 open-ended questions and 4 Likert-type items (rating from 1-not at all to 4-very much) for acceptability (see Appendix K for items and responses). When asked if students liked reading in one condition more than the other, 20% of students indicated that they had no preference, 30% indicated that they preferred reading the whole passage, and 50% of students indicated that they preferred reading the passage in sections. Common reasons students preferred RR1 included not having to stop frequently, it being faster, and it being easier to complete all at once. Common reasons students preferred RR2 included being able to practice before putting it all together and not getting as lost in the text. When asked if students thought they read faster with one or the other, 50% of students indicated that they thought they read faster when reading the whole passage while the other 50% indicated that they thought they read faster when reading the passage in sections.

On a Likert item asking about enjoyment working with the researchers, the average rating across students was a 3.4 (scores ranged from 2 to 4), suggesting that students generally enjoyed working with the researchers. On an item asking if students liked passages they read, the average rating across students was a 2.9 (scores ranged from 1 to 4), suggesting that students generally liked the passages they read. On an item asking if students thought their friends would like to read these passages, the average rating across students was a 2.5 (scores ranged from 1 to 4), suggesting that students were neutral as to whether their friends would like the passages they read. On an item asking if students liked practicing reading passages or sections multiple times, the average rating across students was 2.5 (scores ranged from 1-4), suggesting that students were neutral about getting to practice the passage multiple times. Likert scale item rating results can be viewed in Table 4.

Chapter IV

Discussion

Previous research investigating the effectiveness of RR demonstrated that RR interventions resulted in improved oral reading fluency but was lacking in clear operationalization of procedures for RR interventions (Chard et al., 2002; Herman, 1985; Meyer & Felton, 1999; Rasinski et al., 2021). Some research has found that though RR is generally effective for improving reading fluency, many of the studies evaluating RR interventions may not be methodologically rigorous (Chard et al., 2009; Naveenkumar et al., 2021; O'Keeffe et al., 2012). The purpose of this study was to examine the differences between two variations of RR interventions and further provide operationalization of the best procedures to use when implementing RR intervention. This study found further evidence for the use of RR intervention in increasing reading fluency (WCPM), as demonstrated by statistically significant gains in WCPM during maintenance sessions, confirming previous research. The results of this study provide clearer guidelines for administration procedures that can be used when implementing RR interventions. All data tables can be found in Appendix A.

Research Question One: Changes in WCPM

Change scores were used in the analyses to answer research questions. Across all participants, the mean change score from pre-test to post-test was 13 WCPM in RR1 and 11 WCPM in RR2, suggesting no major differences between improvement in WCPM between the two variations of the RR intervention. While a t-test found no significant difference in the improvement in WCPM, it should be noted that a greater than 10 WCPM change after one brief intervention session is a great improvement for struggling readers. If this intervention was implemented over multiple sessions, significant gains in reading fluency may occur. The results

of our analyses did not confirm our hypothesis. Though previous research suggested that shorter reading passages results in greater improvement in oral reading fluency, we did not see significant changes between students reading the chunked (smaller) passage (Bastug & Keskin, 2014). However, we were not directly assessing passage length as students did read the whole passage in the end.

Research Question Two: Differences in Implementation Time

Length of intervention time was recorded for each participant for both RR1 and RR2 (see Table 1). We hypothesized correctly that RR1 procedures would take less time than RR2. All students required less time to complete RR1 intervention procedures than RR2. On average, it took approximately 1 minute and 17 seconds longer to complete RR2, though a range from an 11 second to 169 second difference was observed. Most students (8/10) were able to complete either intervention in under 10 minutes, which is feasible for educators to implement. Time in schools is invaluable; thus, many educators need interventions that can be easily implemented and result in great improvements in a short amount of time. Additionally, increased intervention times often resulted in increased behavioral problems, such as whining, squirming, and refusal. These results suggest that this intervention can be implemented in a short amount of time and may lead to large gains in reading fluency skills. Since previous research often set a time limit or did not discuss time, this finding can be considered a new contribution to research.

Research Question Three: Group Differences

The mean change score from pre-test to post-test for students at instructional level was 15 WCPM in RR1 and 4.8 WCPM in RR2 (see Table 2). The mean change score from pre-test to post-test for students below instructional level was 11.8 WCPM in RR1 and 21 WCPM in RR2 (see Table 2). Though no statistically significant differences between the at instructional level

and below instructional level groups were observed, these scores suggest that RR1 may be better for at instructional level readers while RR2 may be better for below instructional level readers.

Previous research indicated that certain variations of RR interventions were better for students who were beginning readers, while all variations of RR interventions were equally as effective for students with average reading levels (Dowhower, 1987; Meyer & Felton, 1999). This research suggested that students who were at instructional level would benefit more than students' below instructional level; however, this study did not align with previous research or the hypothesis. Rather, results of this study suggested that RR1 intervention was better for at instructional level students, while RR2 intervention was better for below instructional level readers. This result could be due to individual differences in the participants, such as attention levels or stamina for reading longer passages. Additionally, Bastug and Keskin (2014) demonstrated that shorter passages (ie., 100 vs. 200-word passages) resulted in increased reading rate and accuracy, which may be why students who were at a lower reading level showed more improvement when reading chunked, shorter passages before putting it all together.

Research Question 4: Maintenance of Changes

Analyses examining differences between post-test and maintenance scores revealed no significant changes in WCPM. However, changes in WCPM between pre-test and maintenance for RR1 and RR2 were found to be statistically significant (see Table 3). Across all participants, the mean WCPM at pre-testing was 83 WCPM. The mean maintenance WCPM for RR1 was 97.3 while the mean WCPM for RR2 was 94.4, resulting in a difference of approximately 3 WCPM between average maintenance scores for RR1 and RR2. Overall, students appeared to maintain gains for both RR1 and RR2, suggesting that continued intervention could produce gains in reading fluency that maintain. Though this result did not align with the hypothesis that

RR2 would maintain better based on research that distributive learning was a more successful way to teach information, both interventions seemed to effectively maintain gains in WCPM (Sayeski et al., 2017). This finding could be due to individual differences in participants, a small number of participants, or a lack of intervention sessions to adequately evaluate differences in effectiveness and maintenance of gains in WCPM.

Individual Differences

Though no significant differences were found, examination of individual differences indicated clinical significance for gains in WCPM for most students (see Table 5). Overall, 9 out of the 10 students had some gains in WCPM after receiving the RR1 intervention. For RR2 intervention, 7 out of the 10 students had some gains in WCPM after receiving the intervention. The students who did not improve performed similar or above their pre-test WCPM on the maintenance measures. RR1 intervention seemed to be more effective for participants 4 and 10, while RR2 intervention seemed to work best for participants 2, 3, and 8. Participants 1, 6, 7, and 9 had a difference in gains from pre to post for both RR1 and RR2 that was less than 5 WCPM, which suggests that neither intervention seemed to work significantly better than the other for these participants. Participant 5 decreased in WCPM for both RR1 and RR2 interventions.

When looking at maintenance data, participants 3, 4, 5, and 8 had similar maintenance of WCPM for both RR1 and RR2. The difference between the maintenance scores for RR1 and RR2 was less than 5 words. Participants 1, 2, and 10 all seemed to maintain RR1 better. These participant's maintenance scores for RR1 were 5 or more WCPM greater than their RR2 maintenance scores. Participants 6 and 9 seemed to maintain RR2 better. These participants' maintenance scores for RR2 were 5 or more WCPM greater than their RR1 maintenance scores. Participant 7 had the same WCPM maintenance score for both RR1 and RR2 passages.

Overall, statistical analyses suggest a larger sample is needed due to variability among participants resulting in a lack of power. However, for some participants, immediate gains were very large. These differences could be due to individual differences, such as attention levels, effort, or stamina. Additionally, participants who began with lower reading levels may have demonstrated larger gains because they had more room for improvement.

Participant Perceptions

Participants in this study had the opportunity to decide which version of the intervention they liked best and which version they believed helped them read faster (see Table 4). In deciding which version they liked best, 20% of students indicated that they had no preference, 30% indicated that they preferred reading the whole passage, and 50% of students indicated that they preferred reading the passage in sections. When asked about which version they perceived themselves to read faster with, students were equally split, with 50% of students indicating that they thought they read faster when reading the whole passage while the other 50% indicated that they thought they read faster when reading the passage in sections. Though the majority preferred reading the passage in sections, some students were indifferent, and a good portion preferred reading the whole passage. Since there were no significant differences in WCPM gains in the two versions of the intervention, we recommended that educators ask the students their preferences as responses were mixed and letting them decide may increase rapport and buy-in from the students.

Limitations and Future Research

Participants

This study consisted of 10 elementary-age students from one university-assisted community school after-school program. 60% of the participants were male and 40% were

female. The majority of the students were from a low socioeconomic status background and minority groups. Further research is needed to obtain a greater number of participants from diverse backgrounds (e.g., age, race, and geographical location). While previous research has been conducted with students with learning disabilities, disability categories were unknown for the participants in this study (Chard et al., 2002, Kim et al., 2017). Thus, additional research is needed to demonstrate effectiveness with additional populations of students, such as students with ADHD. Variability in reading skill among participants and a small number of participants led to a lack of power in statistical analyses, Future researchers should include a larger sample size to address difficulties faced in the statistical analysis of this study.

Setting

This study was conducted in one setting and future research should be conducted across different settings. The setting for this study was an after-school program, which was less structured than a typical school day but had designated academic and enrichment activities. Our study was conducted during the academic hour, though many students appeared fatigued during this time. A few students at a time were taken into a large room and worked at separate tables with individual researchers. Often the room was loud and busy with children playing, yelling, and running around. A more structured intervention setting that occurs during the day may lead to different findings given the fatigue students may experience by the end of the day and the relaxed nature of the after-school program. An ideal setting for future research would include having a larger group of students that can read in a quiet and more structured environment.

Behavior

During this study, many behavioral difficulties were encountered by the researchers, resulting in two of the participants being unable or unwilling to complete the study. Primary

behaviors noted by researchers included refusal, fidgeting, and distractibility. Several students whose data was included in analyses required multiple redirections and prompts to focus on the task at hand. Some of the behavioral difficulties were disruptive to other participants. Future researchers should include behavior management strategies. Since difficulty with reading is associated with an increase in behavior problems, future researchers may expect to have increased behavioral difficulties when working with students who have struggled with reading for a longer period of time (Morgan et al., 2008). Further research into the relationship between addressing reading problems to decreasing behavior problems might be beneficial. Future researchers may consider having a quieter environment, providing advance notice to participants, or implementing a reward plan to help mitigate potential behavioral difficulties.

Need for Longitudinal Research

A large portion of research on RR interventions takes place longitudinally, assessing gains in reading over after an extended period of time where the intervention is implemented (Dowhower, 1987; Elhoweris, (2017); Herman, 1985; Stoddard et al., 1993). However, this study was not designed to examine the longitudinal effects of these interventions. Though gains in WCPM were observed for both interventions, more intervention sessions and a longer maintenance period should be addressed in future research. Gains and maintenance of gains would better be evaluated over a longer period of time where there is a larger opportunity for growth and maintenance can be better monitored. Thus, future research can focus on evaluating differences in oral reading fluency gains for students who receive these interventions for a longer period of time. For example, future researchers might implement this intervention with students 1-2 times per week for 6-8 weeks. Maintenance data could be collected 1 month after the final intervention session and 3 months after the final intervention session.

Implications

Results of this study indicated that there are no significant differences between the administration procedures for RR intervention, suggesting that it is up to practitioners to test and determine which administration procedures best suit the needs of the individual child they are working with. Both RR1 and RR2 resulted in an increase in WCPM for the students, suggesting that regardless of how the intervention is implemented, both effectively target oral reading fluency skills. If a practitioner is unable to test which procedure will work best, it is recommended that they use the "typical" or RR1 administration of RR procedures for typical readers and the "chunked" or RR2 administration procedures for poor readers.

Time to Complete Intervention

Those who implement RR interventions may be concerned about the length of time this intervention will take, especially for less fluent readers. Length of time to complete RR1 and RR2 was recorded and when compared, RR1 tended to take less time overall to implement. If length of time is a concern, educators may consider using RR1. Additionally, using shorter passages will help reduce the overall time the intervention takes to complete. For this study, researchers used 150-word passages, which seemed to be an appropriate length that resulted in most students being able to complete either intervention in 10 minutes or less per intervention. It is recommended that passages be between 100 and 200 words as recommended by Intervention Central and What Works Clearinghouse and is consistent with previous research (Therrien & Kubina, 2006; Bastug & Keskin, 2014).

WCPM

Increases of over 10 WCPM were observed from pre-test to post-test in both RR1 and RR2. Though no statistically significant differences were observed, an average of over 10

WCPM gains after one intervention session demonstrates the potential for significant gains in reading fluency if consistently implemented over a longer period of time. No statistically significant group differences were found; however, mean scores suggested that greater gains were seen on RR2 for students below instructional level. For educators who are working with a student who is struggling to read, RR2 may lead to better gains in WCPM. Results from the maintenance data suggested that students maintained gains in WCPM with both RR1 and RR2.

Conclusion

The purpose of this research study was to examine differences in whole (RR1) versus chunked (RR2) passages used in RR interventions and provide better guidance on the operationalization of procedures used when implementing RR interventions. The results of this study suggest that RR is an effective intervention and either variation (whole or chunked) of the RR intervention could be effective for targeting reading fluency skills. Future research is needed to further evaluate RR intervention modifications and long-term maintenance of gains made. Overall, these results align with previous research that RR is an effective and time-sensitive intervention that can easily be used in schools.

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Appendices

Appendix A

Table 1

Individual Participant Intervention Length of Time for RR1 and RR2

Participant	RR1 Length of Time	RR2 Length of Time
1	5:35	6:50
2	7:00	7:37
3	15:51	18:40
4	6:22	7:39
5	5:03	7:24
6	10:12	10:28
7	6:39	8:29
8	6:30	7:38
9	7:11	7:22
10	7:30	8:40

Table 2

Mean Change Scores for Each Condition of Both Groups

Instructional Level Group	Condition	Mean Change Score (WCPM)	Std. Error
At Instructional Level	RR1	15	6.73
	RR2	4.83	9.57
Below Instructional Level	RR1	11.75	8.25
	RR2	21	11.72

Table 3

Mean WCPM Performance for Pre-Test and Maintenance Sessions for Condition 1 and Condition 2

Group	Mean	N
Pre-Test WCPM	83	10
Condition 1 (RR1) WCPM Maintenance	97.3	10
Pre-Test WCPM	83	10
Condition 2 (RR2) WCPM Maintenance	94.4	10

Table 4

Social Validity Scale Likert Questions and Ratings of Each Item for Each Participant

Participant	Question 1 Rating	Question 2 Rating	Question 3 Rating	Question 4 Rating
1	4	3	4	4
2	3	4	1	2
3	3	1	2	2
4	4	3	4	3
5	4	3	4	3
6	3	2	3	2
7	4	2	4	1
8	2	1	1	2
9	4	4	3	2
10	3	2	3	4

Table 5

Individual Participant Data for WCPM across Screener, Intervention, and Maintenance Sessions

Participant	Screener WCPM	RR1 WCPM	RR1 Maintenance WCPM	RR2 WCPM	RR2 Maintenance WCPM
1	71	113	109	112	92
2	66	85	98	94	90
3*	27	38	29	45	34
4	114	116	116	105	114
5	145	142	143	128	139
6*	53	57	56	61	63
7	76	76	92	80	92
8*	91	121	119	143	123
9*	73	75	74	79	84
10	114	144	137	96	113

* Participants marked with an asterisk were within the below instructional level group

Appendix B

Informed Consent and Opt-Out Form

Informed Consent Statement for Parents

Researchers:
Merilee McCurdy, Principal Investigator
Amber Shuster, Co-Investigator
University of Tennessee, Knoxville

Why is my child being asked to be in this research study?

As part of an active approach to supporting students' academic skills, particularly reading fluency skills, all students in the 3rd and 4th grade will partake in a repeated reading evaluation. The purpose of this evaluation is to inform teachers of students' reading fluency skills. The purpose of this research study is to determine if different versions of repeated readings result in different gains in oral reading fluency. Additionally, we will examine if there is a difference in effectiveness for students at different reading levels. Researchers from the University of Tennessee will administer reading screeners, two versions of repeated readings, and maintenance passages with students during the after-school program. The researchers will ask students to read several different passages using different instructional procedures. Students will be asked to read a full passage or sections of a passage multiple times. While the child is reading, the researcher will record the number of errors made, words read, and the time it takes the child to read. We anticipate that using repeated reading in sections will result in an increase in the words correct per minute read by the student. We would like to collect data on students' reading skills to help us determine if one version of repeated reading is more helpful in improving reading fluency for students in elementary school. Additionally, data on children's reading will be provided to the school to inform teachers on students' reading fluency. The most effective repeated reading program can be taught to teachers and volunteers in the University Assisted Community Schools (UACS) at Pond Gap to help individual students improve their reading skills.

Who is conducting this research study?

This study is being conducted by researchers at the University of Tennessee, Knoxville. Researchers are professors or doctoral students in the school psychology program and have completed research training requirements and background checks for research through the University.

How long will my student be in the research study?

All students will participate in the reading evaluation to inform educators of student reading skills. Regardless of whether the student's information is used in the research study, they will participate in these activities as part of an after-school program evaluation. The students who participate in the study will do so during their academic hour, while in the University Assisted Community Schools Program (after-school program). The first day will consist of screeners, which will take the student approximately 5 to 10 minutes to complete. On the second day, when completing two whole passage reading activities, it is expected to take each student between

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approximately 15 and 30 minutes. The third day and final day, when students will reread the passages they read on the second day, will take between approximately 15 and 20 minutes.

What will happen if I say, "Yes, I want my child to be in this research study?"

If you say yes to allowing us to use your student's assessment responses for research purposes, then information from the assessment that they are participating in as part of reading screeners and activities to assess current reading skills will be analyzed for research purposes as well. We want to better understand the reading needs of students who participate in after-school programs in order to provide more effective supports for students at your school as well as for similar students across the region.

What will happen if I say, "No, I do not want my child to be in this research study?"

Your student will still participate in the assessment as part of the school's reading screening and activities, but their responses will not be analyzed for research purposes. Your student's participation in this study is up to you. You can say no now or have them leave the study later on. If you choose not to allow your child to participate, it will not affect your relationship with the University of Tennessee.

Are there any possible risks to my child?

It is possible that someone could find out your child was in this study or see their study information, but we believe this risk is small because of the procedures we use to protect your information. These procedures are described later in this form. Your child may experience mild frustration or fatigue while reading. If this comes up, breaks can be taken to reduce this risk.

Are there any benefits to being in this research study?

There is a possibility that your child may benefit from being in the study, but there is no guarantee that will happen. Possible benefits include improved reading skills for your child. Even if your child doesn't benefit from being in the study, their participation may help us learn more about reading fluency skills and repeated reading interventions to improve students' reading skills. Additionally, knowing this information will allow us to inform after-school program teachers about the reading needs of their students as well as potential interventions that may be effective for your student's school. We hope the knowledge gained from this study will benefit others in the future.

Who can see or use the information collected for this research study?

We will use a code number on the assessments so that your student's name will NOT be on them. Only summaries of the data that do not identify any individual student will ever be used in the research. Your student's answers will not have any effect on their grades. We will keep anything with your student's name (like the form your student will sign to say if they want to

participate in research) separate. Although it is unlikely, there are times when others may need to see the information we collect about your child. These include:

- People at the University of Tennessee, Knoxville who oversee research to make sure it is conducted properly.
- Agencies and others responsible for watching over the safety, effectiveness and conduct of the research.

What will happen to my child's information after the study is over?

We will keep your child's information to use for possible publication in scientific journals or presentations at scientific meetings. Your child's name and other information that can directly identify them will be deleted from their research data collected as part of the study. All hard copies of data forms will be stored in a locked file cabinet in the researcher's office on the UTK campus and shredded as soon as possible. The electronic database will include his/her participant number. Their data will be stored on the researcher's strong password-protected personal document located on the UTK network, and only the researchers will know the password to access the files.

Who can answer my questions about this research study?

If you have questions at any time about the study or the procedures, you may contact the researcher, Dr. Merilee McCurdy at mccurdy2@utk.edu or 865-974-8144 or Amber Shuster at ashuster@vols.utk.edu. If you have questions about your child's rights as a participant or to speak with someone other than the research team about the study, you may contact:

Institutional Review Board
The University of Tennessee, Knoxville
2240 Sutherland Avenue, Suite 2
Knoxville, TN 37919
Phone: 865-974-7697
Email: utkirb@utk.edu

What do I do if I want my student to participate in the research?

Nothing. **If you want your student to participate in the research portion of the repeated reading screener and intervention, you do not need to do anything.** Your student will still have the chance to say whether or not we can use their data in our research.

What if I don't want my student to participate in the research?

If you do not want your student's reading evaluation data used for research, then please sign and return the next page. **Your student will still participate in the evaluation as part of the**

school's learning plan, but the researchers will not use your student's results as research.
No one will know that your student is not participating in the research unless you tell them.

Research Opt-Out Form

I have read the above information and the research study has been explained to me. I have been given the chance to ask questions and my questions have been answered. If I have more questions, I know whom to contact.

ONLY CHECK THE BOX BELOW AND RETURN THIS FORM IF YOU DO **NOT** WANT YOUR STUDENT TO PARTICIPATE IN THE RESEARCH PORTION OF THE READING EVALUATION.

☐ No, **I do NOT want my student's reading data used for research**. I understand my student will still participate in the repeated reading evaluation as part of the afterschool program's learning plan.

Student's Name	Parent/Guardian Name	Parent/Guardian Signature

Remember: if you want your student's evaluation to be included in the research study, do not return this form. We will still ask your student for permission to use his or her reading data in our research.

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Appendix C

Student Assent Form

STUDENT ASSENT STATEMENT

(This form will be read to the student.)

Hello, my name is [Insert your name]. I am a student at the University of Tennessee. We are working with students to try out reading activities that might help students read better. These reading activities will include reading different stories. Being a part of this study may help you practice your reading skills and help you read better. Sometimes, you may be tired or frustrated, but you can take breaks anytime you want. It is possible that someone could find out you were in this study or find your study information, but we believe this risk is small because we will protect your information. Your real name will be removed from any forms or data we collect and any information we collect will be stored in a secure location.

Sometimes, our meetings will be recorded so that researchers from the University of Tennessee can make sure I am doing everything correctly. If you agree to be in this study, we will keep track of how you are reading to see if the reading activity is helping you read faster. At our next meeting, we will ask you questions about what you think about the reading activity.

Your parents have already given their permission. But even if your parents say "yes" you can still decide not to do this. If you don't want to be in this study, you don't have to. Remember, being in this study is up to you, and no one will be upset if you don't want to participate or even if you change your mind later and want to stop.

You can ask any questions that you have about the study. If you have a question later that you did not think of now, you can ask me now or next time.

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Appendix D

Screener Script and Treatment Integrity Checklist

Screener Script

Passage One:
"Today you're going to be reading some different passages. When I say start, I want you to read this passage out loud. If you get stuck, I will tell you the word so you can keep reading. Start here (point to the beginning of the passage) and read until I tell you to stop. Ready? Begin (start timing)." After 60 seconds, say "Stop."

Passage Two:
"Now, I want you to read this passage. Start here (point to the beginning of the passage). Ready? Begin (start timing)." After 60 seconds, say "Stop."

Passage Three:
"Now, I want you to read this passage. Start here (point to the beginning of the passage). Ready? Begin (start timing)." After 60 seconds, say "Stop."

Things to do throughout:
- Give encouragement once they finish reading the passage, such as good job or nice work!
- If they hesitate for ≥3 seconds, give them the word.

Treatment Integrity Checklist for Screener

Check Box	Steps
	Welcomed the student.
	Introduced activity following the script.
	Started the stopwatch when the student began reading.
	Provided any words after hesitation for 3 seconds (if needed).
	Stopped the stopwatch after 60 seconds.
	Gave directions for second passage following the script.
	Began stopwatch when child began reading second passage.
	Provided any words after hesitation for 3 seconds (if needed).
	Stopped the stopwatch after 60 seconds.
	Gave directions for third passage following the script.
	Began stopwatch when child began reading third passage.
	Provided any words after hesitation for 3 seconds (if needed).
	Stopped the stopwatch after 60 seconds.
	Gave encouragement when child finished reading.

Appendix E

RR1 First Script

Repeated Reading One Script

****Begin intervention timer for RR1****

First Reading:
"Today you're going to be reading some different passages. We will read each passage a few times. When I say start, I want you to read this passage out loud. If you get stuck, I will tell you the word so you can keep reading. Start here (point to the beginning of the passage) and read until the end of the passage. Ready? Begin (start timing)."

Second Reading:
"Now, I want you to read the passage again. Start at the beginning. Ready? Begin (start timing)."

Third Reading:
"Now, I want you to read the passage one last time! Start at the beginning. Ready? Begin (start timing)."

Things to do throughout:
- Give encouragement once they finish reading the passage, such as good job or nice work!
- If they hesitate for ≥3 seconds, give them the word.
- If they mispronounce, substitute, or add a word, provide them with the correct word.

****Stop intervention timer for RR1****

Repeated Reading Two Script

****Begin intervention timer for RR2****

First Reading of Section One:
"Today you're going to be reading some different passages. We will read each passage a few times. When I say start, I want you to read this part out loud (swipe your hand over the first section). If you get stuck, I will tell you the word so you can keep reading. Start here (point to the beginning of the passage) and read until this line (point to the line indicating the end of the first section). Ready? Begin (start timing)."

Second Reading of Section One:
"Now, I want you to read this part again (point to the section they just read). Ready? Begin (start timing)."

First Reading of Section Two:
"Next, I want you to read this part of the passage (point to section two). Start here (point to the beginning of section two) and read until this line (point to the line indicating the end of the second section). Ready? Begin (start timing)."

Second Reading of Section Two:
"Now, I want you to read this part again (point to the section they just read). Ready? Begin (start timing)."

First Reading of Section Three:
"Now, I want you to read the last part of the passage (point to section three). Start here (point to the beginning of section three) and read until the end (point to the end of the passage). Ready? Begin (start timing)."

Second Reading of Section Three:
"Now, I want you to read this part again (point to the section they just read). Ready? Begin (start timing)."

Whole Passage Reading:
"Now, I want you to read the whole passage. Start here (point to the beginning of the passage) and read until the end (point to the end of the passage). Ready? Begin (start timing)."

Things to do throughout:
- Give encouragement once they finish reading the passage, such as good job or nice work!
- If they hesitate for ≥3 seconds, give them the word.
- If they mispronounce, substitute, or add a word, provide them with the correct word.

****Stop intervention timer for RR2****

Appendix F

RR2 First Script

Repeated Reading Two Script

****Begin intervention timer for RR2****

First Reading of Section One:
"Today you're going to be reading some different passages. We will read each passage a few times. When I say start, I want you to read this part out loud (swipe your hand over the first section). If you get stuck, I will tell you the word so you can keep reading. Start here (point to the beginning of the passage) and read until this line (point to the line indicating the end of the first section). Ready? Begin (start timing)."

Second Reading of Section One:
"Now, I want you to read this part again (point to the section they just read). Ready? Begin (start timing)."

First Reading of Section Two:
"Next, I want you to read this part of the passage (point to section two). Start here (point to the beginning of section two) and read until this line (point to the line indicating the end of the second section). Ready? Begin (start timing)."

Second Reading of Section Two:
"Now, I want you to read this part again (point to the section they just read). Ready? Begin (start timing)."

First Reading of Section Three:
"Now, I want you to read the last part of the passage (point to section three). Start here (point to the beginning of section three) and read until the end (point to the end of the passage). Ready? Begin (start timing)."

Second Reading of Section Three:
"Now, I want you to read this part again (point to the section they just read). Ready? Begin (start timing)."

Whole Passage Reading:
"Now, I want you to read the whole passage. Start here (point to the beginning of the passage) and read until the end (point to the end of the passage). Ready? Begin (start timing)."

Things to do throughout:

- Give encouragement once they finish reading the passage, such as good job or nice work!
- If they hesitate for ≥3 seconds, give them the word.
- If they mispronounce, substitute, or add a word, provide them with the correct word.

****Stop intervention timer for RR2****

Repeated Reading One Script

****Begin intervention timer for RR1****

First Reading:
"Today you're going to be reading some different passages. We will read each passage a few times. When I say start, I want you to read this passage out loud. If you get stuck, I will tell you the word so you can keep reading. Start here (point to the beginning of the passage) and read until the end of the passage. Ready? Begin (start timing)."

Second Reading:
"Now, I want you to read the passage again. Start at the beginning. Ready? Begin (start timing)."

Third Reading:
"Now, I want you to read the passage one last time! Start at the beginning. Ready? Begin (start timing)."

Things to do throughout:
- Give encouragement once they finish reading the passage, such as good job or nice work!
- If they hesitate for ≥3 seconds, give them the word.
- If they mispronounce, substitute, or add a word, provide them with the correct word.

****Stop intervention timer for RR1****

Appendix G

Treatment Integrity Checklists

Treatment Integrity Checklist for RR1

Check Box	Steps
	Welcomed the student.
	Introduced activity following the script and began session timer.
	Started the stopwatch when the student began reading.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child read the passage.
	Gave directions for the second reading of the passage following the script.
	Began stopwatch when the child began reading for the second time.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child read the passage.
	Gave directions for the third reading of the passage following the script.
	Began stopwatch when the child began reading for the third time.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and the session timer, and recorded data after the child read the passage.
	Provided encouragement

Treatment Integrity Checklist for RR2

Check Box	Steps
	Welcomed the student.
	Introduced activity following the script and began session timer.
	Started the stopwatch when the student began reading section one.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished section one.
	Gave directions for the second reading of section one following the script.
	Began stopwatch when child began reading section one for the second time.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished section one.
	Gave directions for the first reading of section two following the script.
	Began stopwatch when child began section two.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished reading section two.
	Gave directions for the second reading of section two following the script.
	Began stopwatch when child began reading section two for the second time.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished section two.
	Gave directions for the first reading of section three following the script.
	Began stopwatch when child began section three.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished reading section three.
	Gave directions for the second reading of section three following the script.
	Began stopwatch when child began reading section three for the second time.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished section three.
	Gave directions for the whole passage reading following the script.
	Began stopwatch when child began reading the passage.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and the session timer, and recorded data after the child finished the passage.
	Provided encouragement.
	Read social validity questions and recorded responses.

Treatment Integrity Checklist for RR2

Check Box	Steps
	Welcomed the student.
	Introduced activity following the script and began session timer.
	Started the stopwatch when the student began reading section one.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished section one.
	Gave directions for the second reading of section one following the script.
	Began stopwatch when child began reading section one for the second time.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished section one.
	Gave directions for the first reading of section two following the script.
	Began stopwatch when child began section two.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished reading section two.
	Gave directions for the second reading of section two following the script.
	Began stopwatch when child began reading section two for the second time.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished section two.
	Gave directions for the first reading of section three following the script.
	Began stopwatch when child began section three.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished reading section three.
	Gave directions for the second reading of section three following the script.
	Began stopwatch when child began reading section three for the second time.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child finished section three.
	Gave directions for the whole passage reading following the script.
	Began stopwatch when child began reading the passage.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and the session timer, and recorded data after the child finished the passage.
	Provided encouragement.

Treatment Integrity Checklist for RR1

Check Box	Steps
	Welcomed the student.
	Introduced activity following the script and began the session timer.
	Started the stopwatch when the student began reading.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child read the passage.
	Gave directions for the second reading of the passage following the script.
	Began stopwatch when the child began reading for the second time.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and recorded data after the child read the passage.
	Gave directions for the third reading of the passage following the script.
	Began stopwatch when the child began reading for the third time.
	Provided any words after hesitation for 3 seconds and corrected any errors (if needed).
	Stopped the stopwatch and session timer, and recorded data after the child read the passage.
	Provided encouragement.
	Read social validity questions and recorded responses.

Appendix H

Maintenance Script and Treatment Integrity Checklist

Maintenance Script

Passage One:
"Today you're going to be reading some different passages. When I say start, I want you to read this passage out loud. If you get stuck, I will tell you the word so you can keep reading. Start here (point to the beginning of the passage) and read until the end. Ready? Begin (start timing)."

Passage Two:
"Now, I want you to read this passage. Start here (point to the beginning of the passage) and read until the end. Ready? Begin (start timing)."

Things to do throughout:
- Give encouragement once they finish reading the passage, such as good job or nice work!
- If they hesitate for ≥3 seconds, give them the word.

Treatment Integrity Checklist for Maintenance

Check Box	Steps
	Welcomed the student.
	Introduced activity following the script.
	Started the stopwatch when the student began reading.
	Provided any words after hesitation for 3 seconds (if needed).
	Stopped the stopwatch and recorded data when the child reached the end of the passage.
	Gave directions for the second passage following the script.
	Began stopwatch when the child began reading the second passage.
	Provided any words after hesitation for 3 seconds (if needed).
	Stopped the stopwatch and recorded data when the child reached the end of the passage.
	Gave encouragement when the child finished reading.

Appendix I

Data Collection Sheets

Screener Data Collection Sheet

Date	Passage Number	Story	Words in Passage	Errors	Time	WCPM
	1					
	2					
	3					

Data Collection Sheet Condition One (RR1)

Date	Reading Number	Story	Words in Passage	Errors	Time	WCPM
	1					
	2					
	3					
	Maintenance					

Total Time for RR1: _____

Data Collection Sheet Condition Two (RR2)

Date	Section Number	Reading Number	Story	Words in Section/Passage	Errors	Time	WCPM
	1	1					
		2					
	2	1					
		2					
	3	1					
		2					
		Whole Passage					
		Maintenance					

Total Time for RR2: _____

Appendix J

Error Correction Procedures Cheat Sheet

1. Provide correction for any word mispronounced, substitution, or addition errors.
2. Give any word if the child hesitates for more than 3 seconds.
3. If a line is skipped, count only as one error.
4. Record errors on data collection sheet under errors by marking tallies.

Appendix K

Social Validity Survey

Researchers will read the following and record the student's answers.

"If you remember, we read each story differently. In one story, we read the whole thing. In the other story, we broke it up into smaller pieces."

1. Did you like reading one way more than the other?
2. Why?
3. Do you think you read faster with one or the other?

Likert Scale Items (Rating 1-4; not at all to very much)

1. Did you enjoy working with us?
2. I think my friends would like to read these passages.
3. I liked the passages I read.
4. I liked getting practice reading the passage multiple times.

Appendix L

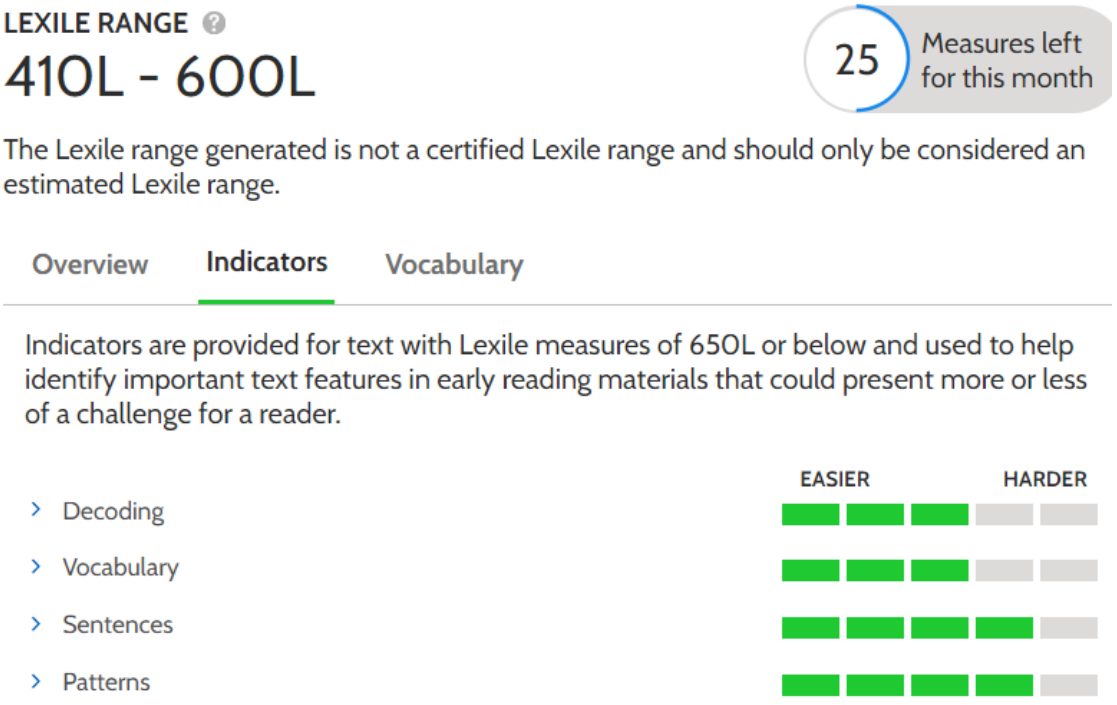
Passage Examples and Equivalency Lexile's

2nd Grade Passage A

Homes get dirty. It's just a part of life. We bring dirt and dust into the home. No matter how much you try to avoid it, your home will get dirty. So, you have to clean it. Here are some ways to help you clean your room and your home!

One way you can clean your home is to keep the dirt out. Try to prevent dirt from coming in. Take off and clean your shoes before you enter. One way to keep your room clean is to pick up every day. Make it a habit to clean every day.

Make sure to clean any big messes right away. Another way to keep your home clean is to put everything in its place. Make sure that everything has a place. When you are done using something, put it away. When you are done playing with a toy, put it away.

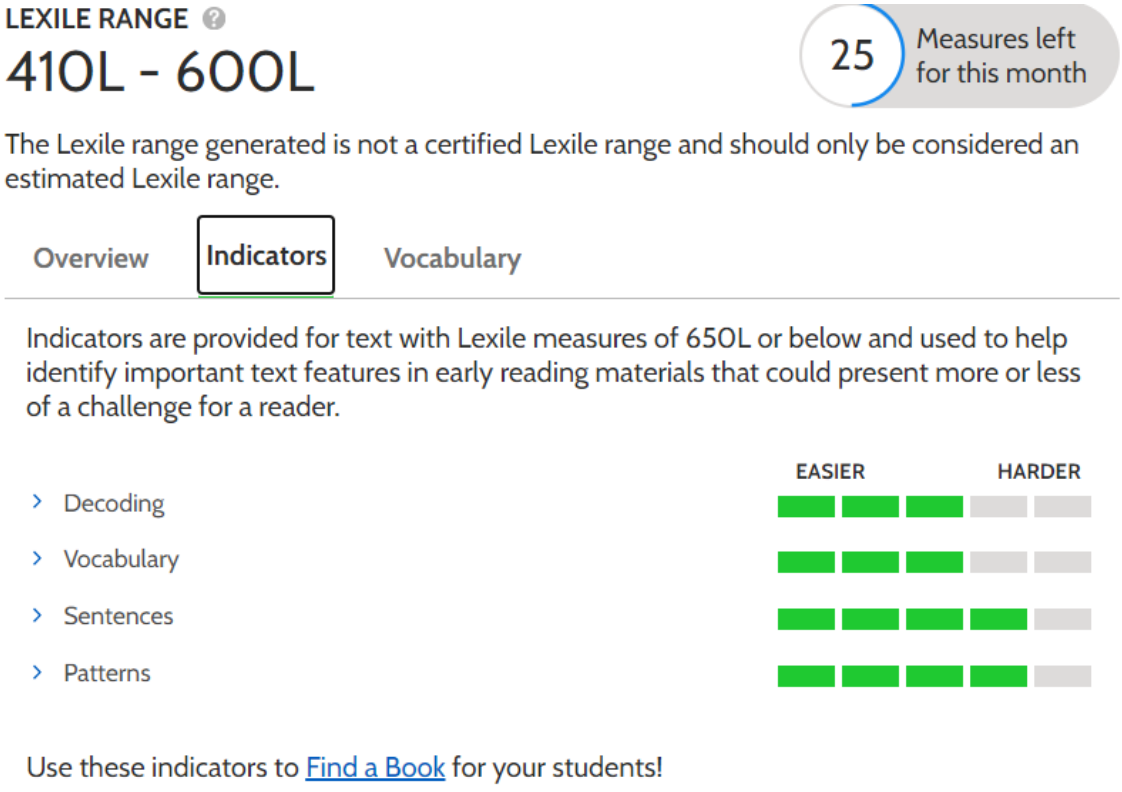


2nd Grade Passage B

I'm Sam and I live on a farm in Texas with my mom and pop. Every morning before I ride the bus to school, I have chores to do. When I come home, I have more chores to do before supper. We have chickens, cows, goats, and two black horses.

It is my job to feed the chickens in the morning. I also check for eggs. In the evening, I feed the cows and goats and horses. My favorite chore is brushing the horses. Both horses have beautiful black coats. I brush them until their coats are shiny and smooth.

The younger horse is called Midnight. I watched when he was born. I named him Midnight because he is all black. Midnight is two years old, still a colt, so I can't ride him until he's older. On weekends, I take him for walks by leading him with a rope.

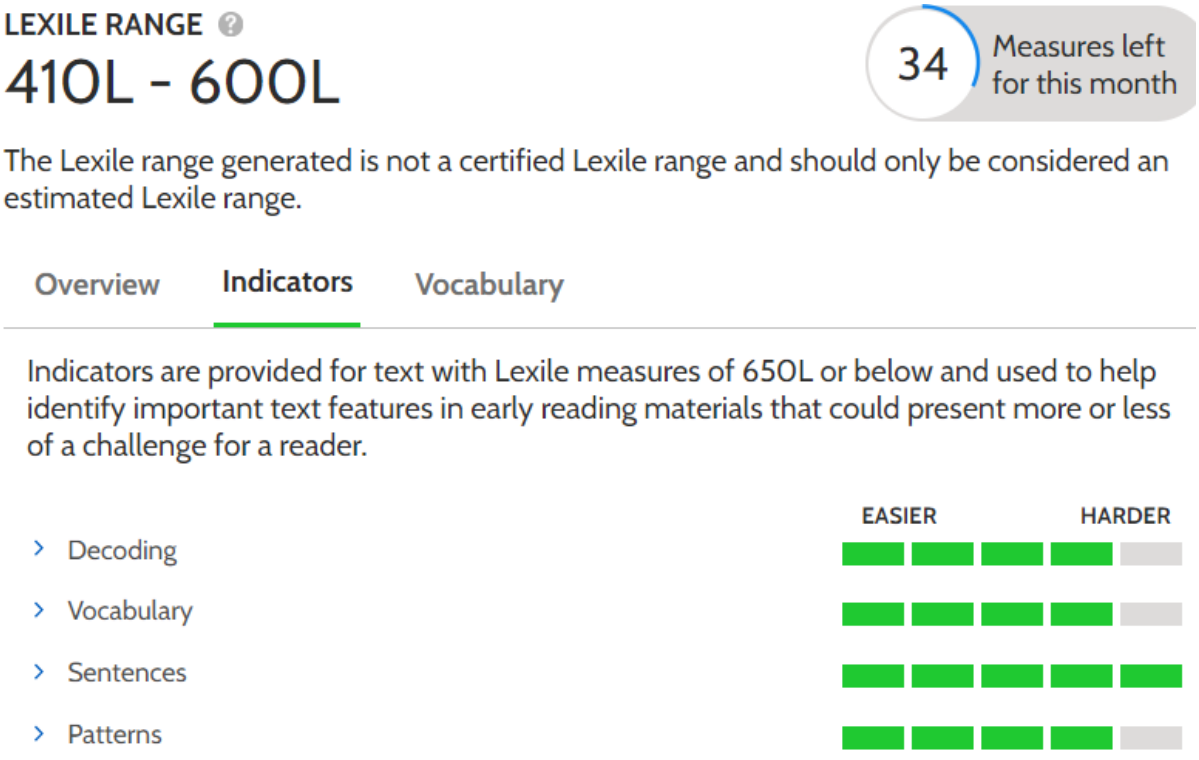


3rd Grade Passage A

Andrew and Tracy knelt in front of an old chest on the dusty floor of an attic. Andrew was holding a brass key in the palm of his hand. They were both looking at the chest like it might get up and walk or leap at them like a tiger.

Andrew licked his lips and shuffled on his knees. He slipped the key into the lock and turned it. Tracy let out a gasp. "Shh," Andrew said. He slipped his fingertips under the lid and slowly lifted. It creaked as the rounded lid came slowly up on its rusty hinges.

"Wow, it's heavy," Andrew said as dust filled the air. Tracy took hold of it with both hands to help him. Together they raised it higher, straining their arms, until it locked into place. The chest yawned wide open. The musty smell of a hundred summers ago drifted from inside.

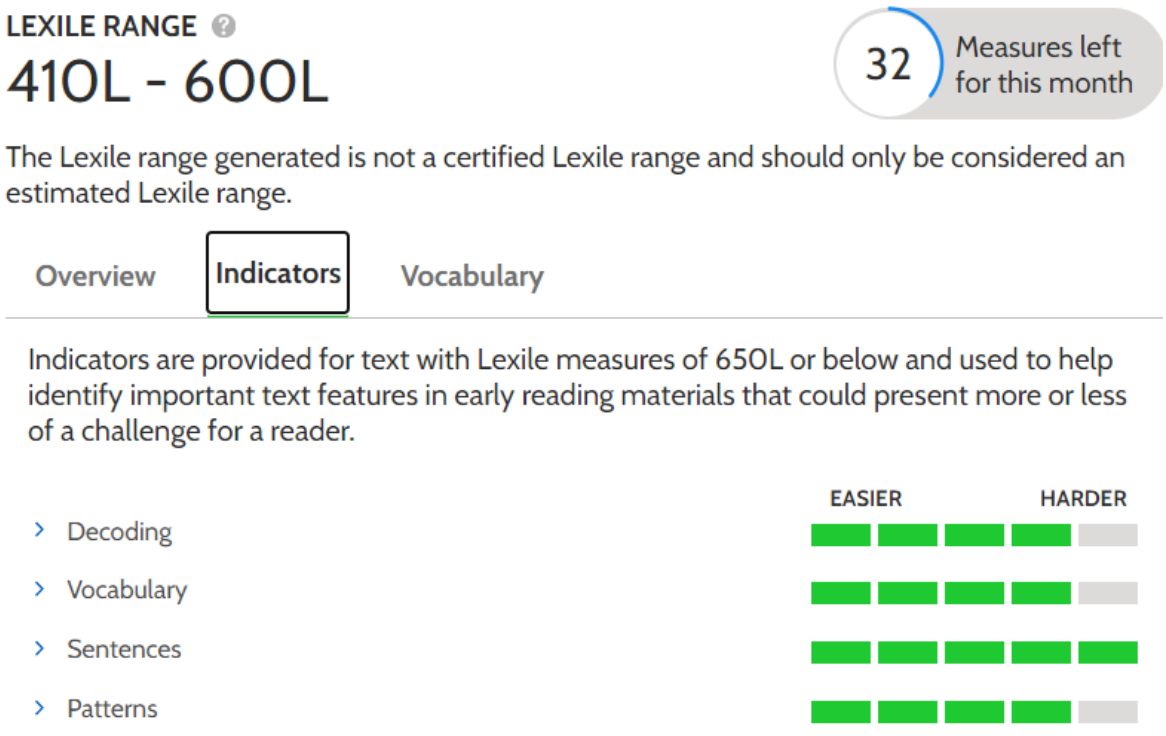


3rd Grade Passage B

One afternoon, Clara tied a rope between two pine trees out in the garden. She put on her yellow silk ballet slippers and walked out onto the rope. The trees cast a thick, dark shade. The sun was bright in the blue sky. Insects buzzed, and birds sang clear notes.

Step by step, Clara walked to the middle of the rope, putting out her arms on both sides for balance. The rope shook as she walked. A gust of wind cooled her forehead. Several times, she swayed and almost fell. She took a deep breath and began to balance herself.

She slowly raised and lowered her arms just a little. At the other end of the rope, she stepped off onto a pine branch. It felt strange to Clara, after walking across the twenty feet of shaking rope, to now be standing on something as solid as a pine branch.

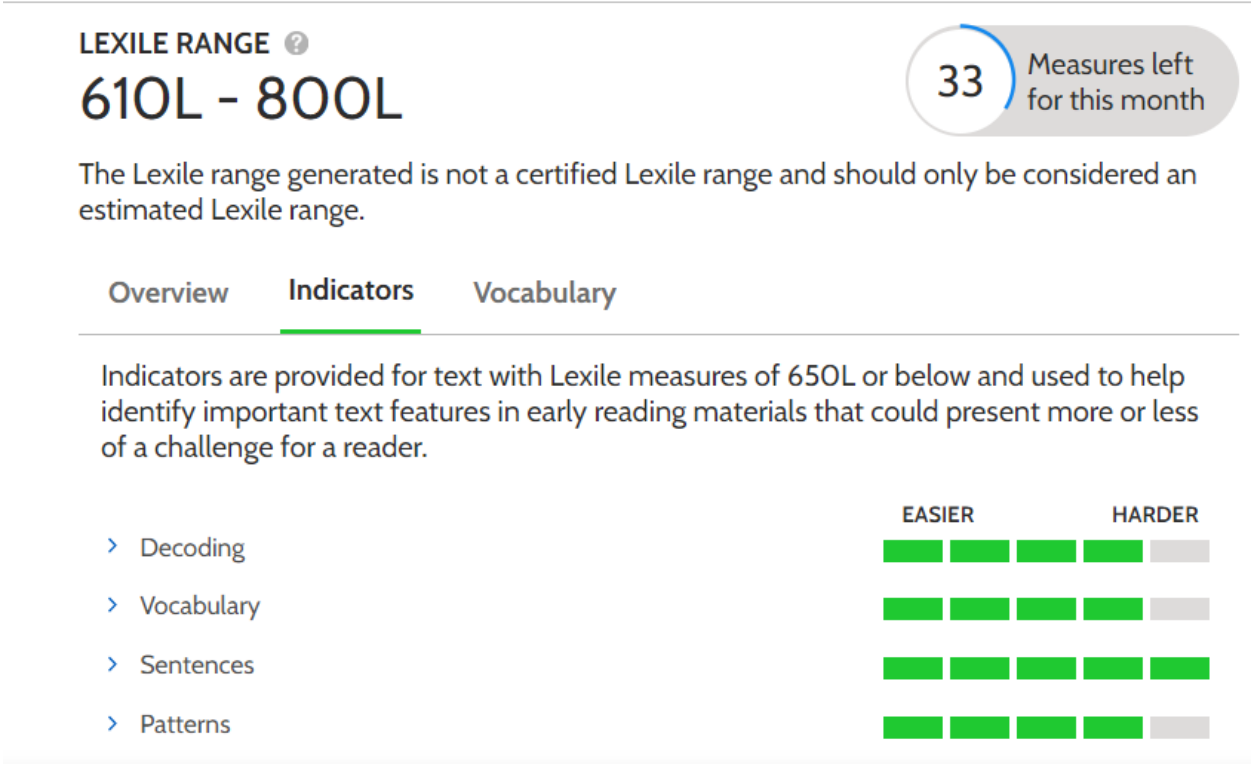


4th Grade Passage A

One afternoon, Clara tied a rope between two pine trees out in the garden. She put on her yellow silk ballet slippers and stepped out onto the rope. The trees cast a thick, dark shade. The sun was blazing in the blue sky. Insects buzzed, and birds sang clear notes.

Step by step, Clara walked slowly to the middle of the rope, stretching out her arms on both sides for balance. The rope shook as she walked. A fresh breeze cooled her forehead. Several times, she swayed and almost fell. She took a deep breath and began to balance herself.

She slowly raised and lowered her arms just a little. At the other end of the rope, she stepped off onto a pine branch. It felt strange to Clara, after walking across the twenty feet of shaking rope, to now be standing on something as solid as a pine branch.



4th Grade Passage B

One day, Edgar and his children, Jim and Morgan, were sailing their boat. Morgan pointed to a strange puff of gray cloud on the bright horizon. As the three of them watched, the small cloud grew quickly into a group of dark clouds. The clouds covered half of the sky.

Edgar jumped up and began taking down the sail. "Help me, kids!" he shouted. "It's going to blow hard!" Jim helped Edgar roll up and tie down the sail, while Morgan quickly fastened the safety lines to the front of the boat. Then, Morgan took out the foul weather gear.

She came up to the back carrying three yellow rain slickers and orange life jackets. Hurrying, they all put on their gear. By now, the air was cold. The dark clouds were directly overhead. It was dark as night even though the sun was still somewhere beyond all those clouds.

LEXILE RANGE

610L - 800L

45 Measures left for this month

The Lexile range generated is not a certified Lexile range and should only be considered an estimated Lexile range.

Overview | **Indicators** | Vocabulary

Indicators are provided for text with Lexile measures of 650L or below and used to help identify important text features in early reading materials that could present more or less of a challenge for a reader.

Use these indicators to Find a Book for your students!

Vita

Amber Shuster was born to Christopher and Dawn Shuster. She grew up in Medina, Ohio with her parents and younger sister, Hailey Shuster. She attended Kent State University for her undergraduate studies. She graduated in May 2018 with her Bachelor of Science degree in Psychology, and a minor in Human Development and Family Studies. Shortly after, she worked in a community mental health center for a year, and later as a social worker in child welfare for a year. She began graduate school in the Fall of 2020 at the University of Tennessee, Knoxville to pursue her Ph.D. in School Psychology. Amber obtained her Master of Science degree in Applied Behavior Analysis from the University of Tennessee in 2022. Additionally, she has completed all coursework to obtain a graduate certificate in Grief, Loss, and Trauma that will be awarded upon completion of her doctoral program. Her current research interests include reading interventions, parent-implemented interventions, and parent training programs. Amber will be completing her pre-doctoral internship with the Tennessee Internship Consortium in 2024-2025. She will complete her doctoral degree in 2025. Amber is immensely grateful to her family, friends, and faculty for their continued encouragement and support throughout her academic pursuits.