

AN EVALUATION OF THE EFFECTIVENESS OF REPEATED READING FOR TWO ELEMENTARY STUDENTS IN A RESOURCE ROOM**Kelli Morgan¹ T. F. McLaughlin² Jennifer Neyman³**

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Abstract:

The purpose of this study was to determine if an 11-year-old student with a Specific Learning Disability (SLD) and an 11-year-old student with Other Health Impairment (OHI) would benefit from a repeated reading intervention during their time in the resource room. During each session each student would read a passage three times through. The students individually completed the repeated reading intervention four times a week. Each session lasted about 15 minutes. An ABA experimental design was employed to evaluate the effects of the repeated reading intervention. Two types of reads were assessed, a “cold read” consisted of the participant reading a passage for the first time for 1-minute. While a “hot read” was defined as the second time that the participant read the same passage for 1-minute. Data for cold reads were gathered in each experimental condition while data regarding hot reads were scored only during the repeated reading condition for each participant. The intervention was effective in increasing our participants’ performance for words read per minute and improved their accuracy when reading. The intervention was cost effective and required little training to implement.

Key Words: *specific learning disabilities, reading, repeated readings, fluency, accuracy, other health impairments (OHI)*

Introduction

Reading remains an essential skill that all students must learn in order to be successful during schooling and later in adult life (National Reading Panel, 2000). Students who struggle with reading often drop out of school (Rumberger, 2011) which could greatly affect their future employment possibilities. Therefore reading deficits should be addressed at an early age in order to eliminate the struggles or greatly lessen the effects that these deficits can have on the students when they read upper grades (Cunningham & Stanovich, 1997; Snow, Burns, & Griffin, 1998). Students who do not receive interventions for reading difficulties in the elementary grades will continue to fall farther and farther behind in reading and in school (Daly, Chafouleas, & Skinner, 2005; Swanson, 1999; Swanson, Harris, & Graham, 2013).

Comprehension is an important goal of reading but if a student does not read fluently then their comprehension will be affected. Faster readers encounter more words and idea units, thereby having the opportunity to comprehend more (Marchand, Martella, Slocum, & Martella, 2004).

Students who struggle with fluency will also spend more time processing, thus consuming finite cognitive processing resources, which will leave fewer cognitive resources available for comprehension (Heward, 2013). Reading is a skill that will be in every part of a student's life. It is a part of every part of a student's academic career and if they struggle with reading they will face challenges in most other academic areas.

Review of Literature

Struggling readers face challenges in all areas of reading such as decoding, fluency, vocabulary, and comprehension (Archer, Gleason, & Vachon, 2003). There are several components to the fluency including rate of reading, prosody and attention to punctuation (O'Connor, White, & Swanson, 2007). This skill is critical for comprehension of a text and with this ability a student is going to struggle with comprehension. Fluency problems stem from decoding or dividing sentences into meaningful phrases (Therrien, 2004). By focusing on ways to address this issue of fluency we can then hopefully increase the student's comprehension. Students with better comprehension are students who read words faster than students with poor reading skills (O'Connor et al.). Increasing the fluency rates of a student we can help them to increase their comprehension of what they are reading. The ability to recognize words rapidly and accurately is the key to good reading comprehension (Mercer, Campbell, Miller, Mercer, & Lane, 2000).

There continues to be a strong focus evaluating reading interventions with younger students with learning disabilities (Catts & Hogan, 2003; Swanson, Hoskyn, & Lee 1999; Wexler, Vaughn, & Roberts, 2010). The term 'Specific Learning Disability' (SLD) general definition is a disorder in one or more of the basic psychological processes involved in understanding or in using language, whether it is spoken or written. The disorder may manifest itself by issues in one's ability to listen, think, speak, read, write, spell or to do mathematical calculations (Heward, 2013). Approximately 44.4% of students have been diagnosed as having a learning disability and most of these students receive services in a resource room setting (Swanson & Vaughn, 2010). Majority of students with SLD will struggle with reading; about 80% have deficits in reading (Nelson, Alber, & Gordy, 2004). These deficits stem from their lack of decoding strategies; they read laboriously and depend on context and pictures (Nelson et al.). Reading disabilities can affect students throughout their academic careers, 74% of students in 3rd grade who have reading disabilities will continue to read below grade even into 9th grade and by the end of high school 27% of seniors are below basic reading level (Zentell & Lee, 2012). It is essential that there is early intervention for these students, for without it, their reading difficulties may never be addressed. For a student with a reading disability their academic performance will continue suffer as this will affect them in all other academic areas. Students with learning disabilities need to receive specialized and direct instruction to improve their reading. One skill to focus on is their fluency and accuracy when reading.

To address the struggles in reading that some elementary students face, there are many evidence-based interventions that have proven successful in increasing the reading abilities of students in elementary grades (Daly et al., 2005; Swanson et al., 1999). Examples of these strategies include Direct Instruction flash cards, reading race racetracks, model-lead-test and error correction, assisted or repeated reading. A recent meta-analysis that examined repeated reading as an intervention, Therrien (2004) found improvement across a wide range of student populations and age groups.

For students in high school who struggled with reading are faced with many more challenges. Reading is required in all subjects and a large amount of reading required of students is requested to be done independently. In high school students are faced with material that is more complex and is presented to them at a much more challenging rate (Wexler, et al., 2010). Many students who enter the upper grades still struggling to read often fail to attain even the most functional level of literacy even after participating in interventions.

There has been a great deal of research evaluating the effectiveness of repeated reading on increasing fluency and accuracy of a student with learning disabilities (Therrien, 2004). A typical repeated reading intervention contains the following steps. During a repeated reading intervention a student will read a passage for one minute. This is defined as the 'cold read' or first read. After they have read this passage, a fluent reader (such as teacher, adult volunteer or other student in the class) will model reading the passage orally to the student. Previous literature has supported that an adult modeling expressive reading helps to improve a student's fluency (Lo, Cooke, & Starling, 2011). After the model read, the student will read the entire passage once more without a time limit, during this read any errors made will be corrected. This requires an adult or peer instructor to correct the student on any missed words during the rereading of the passage through a model, lead, test format. This helps students to improve their accuracy in future readings. Once the student has completed this reading they complete their second timed reading, or the 'hot read'. Just as with the first read this read will be timed for one minute. During this read the instructor should provide the student with encouragement to 'read fast' and to praise the student's improvement. Providing positive encouragement to students has been associated with increases in oral reading fluency for students with and without disabilities (Lo et al., 2011). The words read per minute and errors the student made are recorded only during the timed readings. Students who are taught with repeated reading show significant increases in their fluency and comprehension levels (O'Connor, et al., 2007). This extra exposure to the reading provides students with the additional opportunities to read (Freeland, Skinner, Jackson, McDaniel, & Smith, 2000; Sherman, McLaughlin, Derby, & Johnson, 2009). These additional opportunities help the students to quickly recognize words, and there increase their speed and accuracy.

The hypothesis behind repeated readings is that a student's fluency and comprehension will improve based on the idea that the increased exposure and feedback when reading will help them (Wexler, Vaughn, Roberts, & Denton, 2010). Multiple research studies have been completed to analyze the effects of the repeated reading intervention on students with learning disabilities (Therrien, 2004). There have been six major reviews of all the studies completed on repeated readings each analyzing the effects of repeated reading on improving oral reading of students. Even the National Reading Panel (NICHHD, 2000) analyzed 50 studies on repeated and guided oral reading found them to be effective (O'Keefe, Slocum, Burlingame, Snyder, & Bundock, 2012). Prior research has shown that repeated readings can be used to increase rates of accurate oral reading, their words read per minute and even the comprehension (Freeland et al, 2000).

A recent study by Lo et al. (2011) focused on the effects of repeated reading on increasing oral fluency in students with learning disabilities on non-transfer passages (passages a student has practiced multiple times) and a transfer passage (a passage the student has never seen before).

Their results showed that when combined with other research-based components such as error correction, modeling and positive feedback student's oral fluency improved on transfer passages.

The purpose of this study was to evaluate the effects of the repeated reading intervention on the fluency and accuracy of an elementary aged student with a Specific Learning Disability (SLD) in a resource room. A second purpose was to extend and add to the literature using repeated reading. Data were gathered for both fluency and accuracy. Finally we wanted to withdraw our procedures to tentatively examine maintenance of treatment effects (Alberto & Troutman, 2012) over time. If maintenance occurred to different passages, this would provide a partial replication of Lo and colleagues.

Methodology

Participant and Setting

There were two participants in the study. The first participant was a fourth grade boy who was 11-years-old and he was diagnosed with a learning disability. He spent most of his day in his general education classroom room and came to a special education resource room every day for reading and writing services. The total amount of time he spent in the special education resource room was 80 minutes a day Monday, Tuesday, Wednesday and Friday. On Thursdays he was only in the resource room for 40 minutes. The first participant's most recent DRA level was a 34 (out of 60). The classroom teacher uses the DRA or Developmental Reading Assessment is used as a progress monitoring tool and it allowed teachers to observe their students reading behaviors and flag any students who might qualify for services. The first participant was able to read a 4th grade level passage with 40% accuracy, as measured by the special education classroom master teacher.

The second participant was an 11-year-old 4th grade female student who had been diagnosed with Other Health Impairment (OHI). She spent most of her day in the general education classroom and came down to the resource room for reading, writing and math. The total amount of time she spent in the special education resource room was 120 minutes a day Monday, Tuesday, Wednesday and Friday. On Thursdays she spent a total of 80 minutes in the resource room. Her most recent DRA level (Beaver & Carter, 2006) was 28 (out of 60). She was able to read a 3rd grade level passage with 60% accuracy, as measured by the special education teacher data.

The study took place in the special education resource room in an urban public elementary school in the Pacific Northwest. The special education resource room focused on reading, writing and math for students who spent most of their day in their general education classroom. There were typically 12 students in the room at a time working in small groups on different tasks with the special education teacher or an instructional assistant. The study took place between 9:00 and 10:10 a.m. on Monday, Tuesday, Wednesday and Friday. The first author worked with each participant individually. The first author and each participant sat at a table or in the book corner away from the other students who were in the room at the time the study was done. The study was conducted by the first author who was completing a graduate degree from a local private university.

Materials

All reading passages for baseline and the intervention were obtained from the Reading A – Z online leveled reading program (<http://www.readinga-z.com/>). Each leveled passage correlated with a grade level and a Developmental Reading Assessment (DRA) level (Beaver & Carter, 2006). The words per minute and the accuracy were calculated on the passages and then recorded onto data collection sheets. (See Figures 1 - 4).

Baseline 1	Cold Read	Hot Read	Baseline 2
81			
91			
91			
	67		
	141		
	122		
	50	172	
	78	124	
	13	22	
	25	101	
	110	151	
	79	113	
	76	104	
	93	128	
	117	143	
			61
			76
			64

Figure 1: Participant 1 data collection sheet – words read per minute for cold and hot reads.

Baseline 1	Cold Read	Hot Read	Baseline 2
62			
62			
62			
	72		
	108		
	121		
	124		
	68	89	
	100	104	
	38	50	
	89	93	
	89	125	
	67	92	
	30	71	
	72	95	
	132	144	
	105	143	
	84	100	
	143	162	
			74
			46
			56

Figure 2: Data collection sheet for Participant 2 – words per minute for cold and hot reads.

Baseline 1	Cold Read	Hot Read	Baseline 2
92			
90			
91.2			
	98		
	98.5		
	97.5		
	96	98.8	
	97.4	95	
	92	95.5	
	94.5	97	
	98.1	98	
	96.2	98.2	
	97.4	98	
	97.8	99	
	99	99	
			96
			97
			98

Figure 3: Participant 1 data collection sheet for accuracy rate for cold and hot reads.

Baseline 1	Cold Read	Hot Read	Baseline 2
90			
91			
90			
	93		
	99		
	97.7	98.3	
	83	97.7	
	99	99	
	91.4	97	
	96.6	96.7	
	97.7	98.4	
	92.5	96.7	
	93.3	94.4	
	95.8	98.9	
	97.7	97.9	
	99	99	
	97	98	
	97.9	98.7	
			94.5
			91.3
			89

Figure 4: Participant 2 data collection sheet accuracy rate for cold and hot reads.

The passages were selected based on each participant's present reading level. These present levels were based on classroom data from the Resource Room teacher and the regular education teacher. The first author also used each participant's score from their most recent DRA. The Reading A to Z website's had grade level passages that were not only leveled by grade but also correlated with DRA scores. The first participant read an S level passage during baseline and during the intervention. An 'S' level passage was a late 3rd grade level passage at a DRA 34. The second participant read a passage at a level 'Q', which is at early 3rd grade level.

Dependent Variables

The target response was accurately reading a 150 to 250 word passage orally for one minute. The number of correct words and errors were counted by the first author during the study. A correct word read was defined as saying out loud a written word correctly, a sentence read out loud with no substitutions, missed words and repetitions. An error was defined as reading a word incorrectly, missing a word, self-correction, skipping sentences, substitutions and repetitions.

To measure the variable the first author tracked the errors on their copy of the passage. The number of words read in one minute was also noted on the first author's copy of the passage. Words that were orally read incorrectly by the participant were crossed out and the word the participant said was written. Words that were missed by the participant were crossed out and any words or sentences that were repeated were underlined and where the participant stopped reading was marked with a slanted line.

The participant was presented with the passage and told that they should read the passage orally. The errors and words read in one minute were also all tracked on the passage. The participants first had to read the passage while being timed by the first author. These reads were defined as a 'cold read'. Once the participants were done with the first read the first author would read the passage to model to the students. This modeling of reading the passage only occurred for a few of the sessions during the intervention. The first author did not have enough time during the intervention to model the reading. Even when the participant had read the passage in the session prior the first read was considered a cold read. After they had read the passage once, the participants would then have to read the passage without being timed. During this second untimed reading the first author would provide corrective feedback the participants if they made any errors as they read the passage. After they had completed the untimed read of the passage the participant then did another timed read of the passage. As with the first reading they would have a minute to read the passage orally. Just as during the first reading the first author tracked the errors and words read per minute while the participants were reading. The accuracy was then calculated for both of the first and second readings. The accuracy was calculated by first counting the number of errors made and subtracting that number by the total number of words per minute. That number was then multiplied by 100 yielding a percentage. Every three sessions during the intervention phase a new reading passage was introduced to the participants.

Experimental Design and Conditions

An ABA design (Kazdin, 2011, McLaughlin, 1983) was used to evaluate the effectiveness of the repeated readings on the participants' fluency and accuracy of oral reading. After three days of baseline, the repeated reading intervention was employed. After 10 sessions for Participant 1 and 15 sessions for Participant 2, a return to baseline took place for 3 sessions for both of the participants. The first participant was absent frequently toward the end of the study and was unable to complete the 15 sessions in the repeated reading intervention so the intervention had to end early to return to baseline conditions.

Baseline 1 and 2. During baseline each of the participants worked individually with the first author. The participant read the passage that was provided to them for 1 minute. They were not provided with any prompting, corrections or other assistance while reading in baseline. The first author told them that they could skip over any unknown words. Their errors were recorded along with the number of words per minute (WPM). The participant was provided with passages. The participants were told they should do their best and were given non-contingent praise when reading.

Repeated reading. The participants were provided with a passage from the Reading A to Z website (<http://www.readinga-z.com/>). The first read the participant read was timed for 1 minute. The errors and words per minute were tracked by the first author but not feedback was given to the participant. After this read the participant read the passage once more orally to the first author but was provided corrective feedback on errors that were made. The participant was able to read the entire passage, taking as long as they needed. No errors or words per minute were tracked during this read. Once the second read was completed the participant moved onto the next timed reading, also known as the 'hot read'. As with the cold read the first author provided no feedback to the participant but tracked the errors made and words per minute on a separate passage. Their accuracy percentage was calculated and recorded on a data collection sheet (See Figures 1-4). The number of words read per minute was also recorded on a data collection sheet. The participants were provided a new passage to read every three sessions during the intervention conditions.

Reliability of Measurement

Inter-observer reliability or agreement was conducted once during baseline and three times during the repeated reading intervention. The first author would record the participant during the intervention and then review the video with an outside person. The outside person would then track each of the student's errors and words read per minute as they watched the video recording. The percent of inter-observer agreement was calculated by dividing the smaller number of errors recorded by one observer by the larger number of errors recorded by the second observer and then multiplying by 100. The same procedure was done to for the words read per minute. The percent of inter-observer agreement for accuracy was 98% (range: 95 to 100) and the percent of inter-observer agreement for words read per minute was 98% (range: 95 to 100).

Findings

Words per Minute

Participant 1. The mean number of words read per minute in baseline 1 was 87.7 wpm, (range: 81 to 91 wpm). During the first repeated reading condition, the mean number of words read was 80.9 wpm (range 50 to 141wpm) during the first time the participant did a reading (cold read) of the passage. During the second reading of the passage (hot read), the mean number of words read per minute increased to an average of 117.6 wpm (range: 22 to 172 wpm). During the reversal the mean number of words read was 67 wpm (Range: 61 to 76 wpm). (See Figure 5)

Participant 2. The mean number of words read per minute in baseline 1 was 62 wpm (range: 62 wpm). During the first repeated reading condition the mean number of words read was 96.1 wpm (range: 68 to 143 wpm) during the first reading (or cold read). The second reading, or hot read, of the passage, the mean number of words read was 105.6 wpm (range: 89 to 162 wpm). During the reversal the mean number of words read per minute was 58.6 wpm (range: 46 to 74 wpm). (See Figure 6)

Percent Correct

Participant 1. The mean accuracy rate during baseline for the first participant was 91% (range: 90 to 92%). During the first reading of the passage the mean accuracy rate increased to

96.8% (range: 92 to 99%). His second reading data regarding accuracy increased to 97.6% (range: 95 to 99) during the second reading of the passage. During the reversal the mean accuracy did not change with an average rate was 97% (range: 96 to 98%). (See Figure 7)

Participant 2. The mean accuracy rate during baseline was 90% (range 90 to 91%). During the first read of the passage, the cold read, the mean accuracy rate was 95.3% (Range: 83 to 99%) and during the second reading or the hot read of the passage the accuracy rate was 97.7% (range: 97.7 to 99%). In the return to baseline conditions the mean accuracy rate was 91.6% (range: 89 to 94.5%). (See Figure 8)

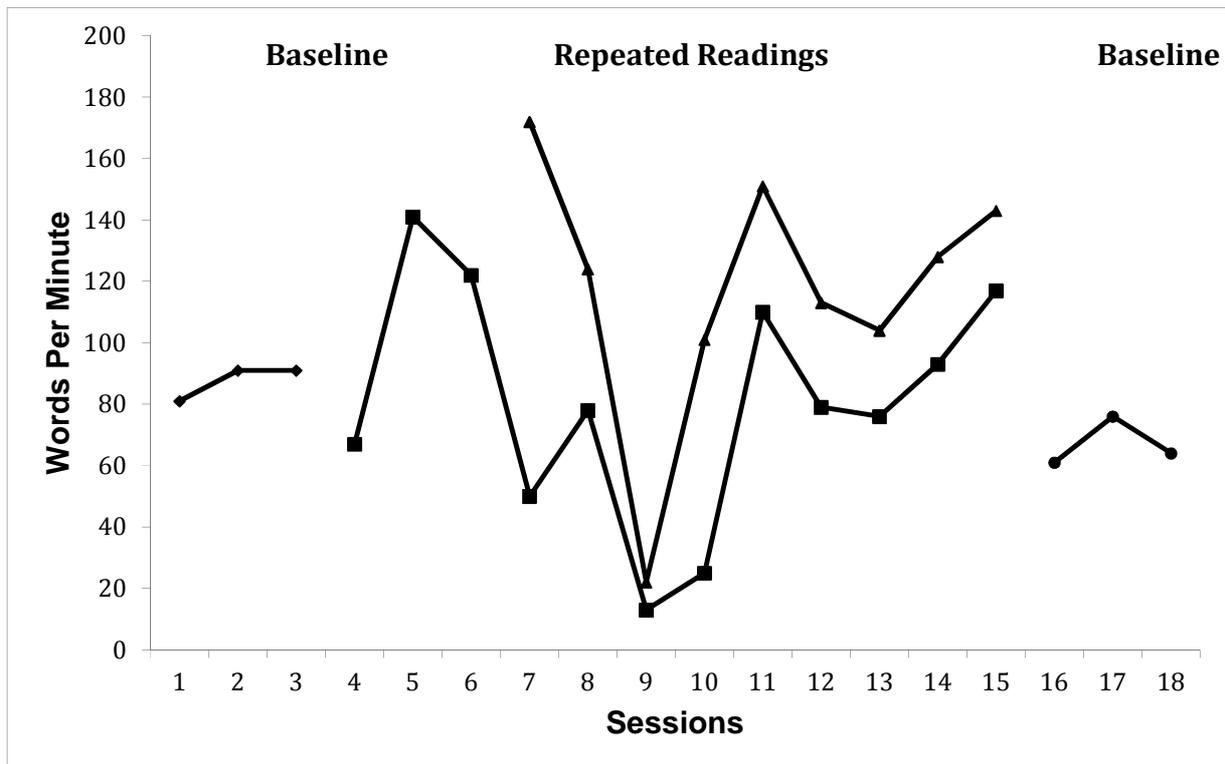


Figure 5: Participant 1: The number of words read per minute is shown for baseline, repeated readings intervention and during the reversal back to baseline. Closed squares indicate the first timed reading (cold read) and the closed triangles show the second timed read (hot read).

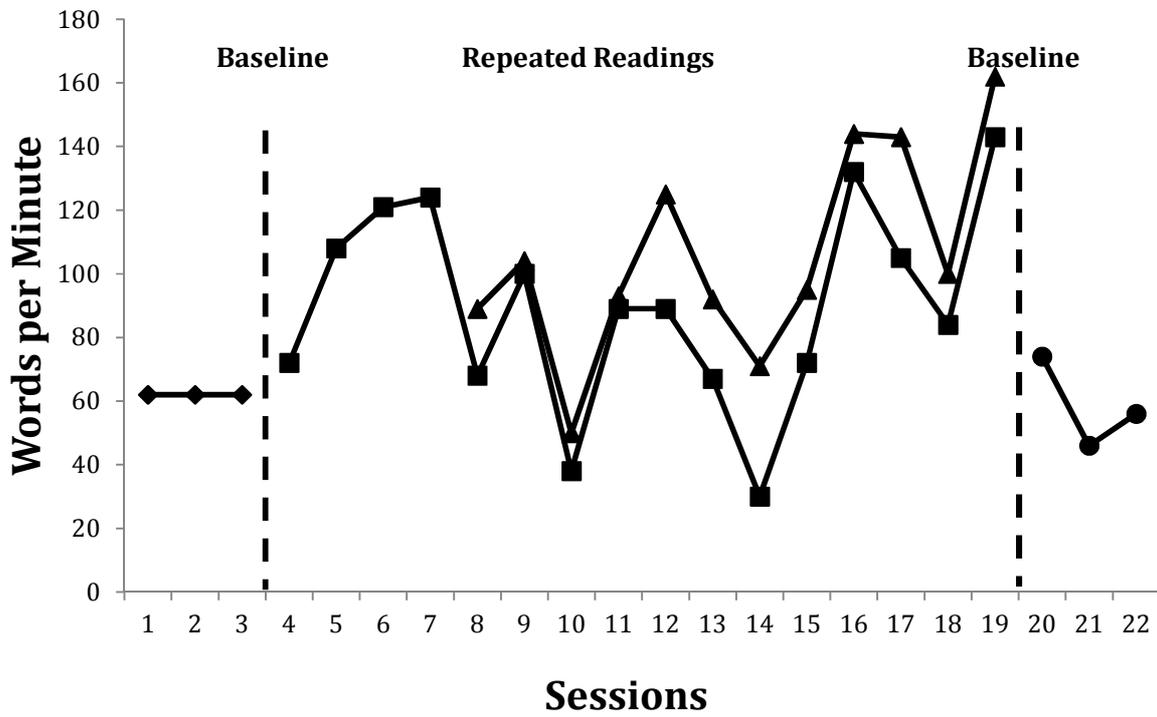


Figure 6: Participant 2: The number of words read per minute is shown for baseline, repeated readings intervention and during the reversal back to baseline. Closed squares indicate the first timed reading (cold read) and the closed triangles show the second timed read (hot read).

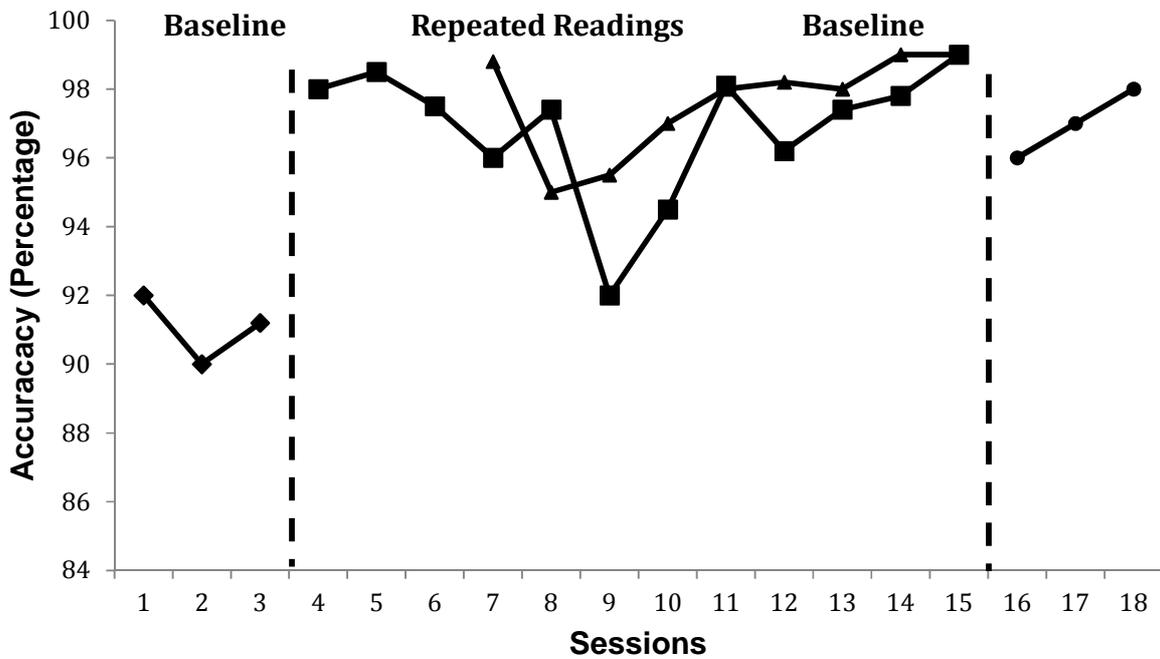


Figure 7: Participant 1: The percent correct for the participant during baseline, the repeated readings intervention and the reversal. The closed squares represent the first reading (cold read) and the closed triangles represent the second reading (hot read).

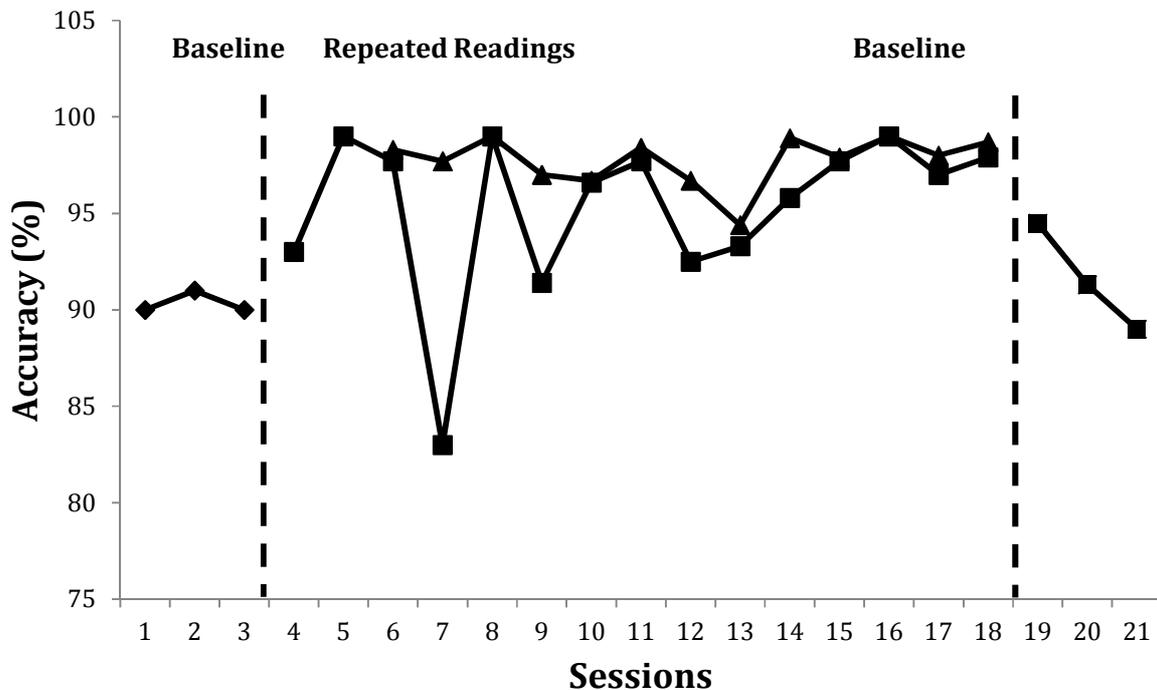


Figure 8: Participant 2: The percent correct for the participant during baseline, the repeated readings intervention and the reversal. The closed squares represent the first reading (cold read) and the closed triangles represent the second reading (hot read).

Conclusion

The repeated reading intervention was effective for both of the participants. There was an increase in the number of words read per minute and an increase in the accuracy of their reading. The intervention allowed the students to compete against themselves to improve his or her score and helped them to improve their fluency when reading orally.

Improvement in fluency and accuracy when orally reading was socially significant (Wolf, 1978) for the participants. They were able to see their improvements immediately and both of our participants became more confident with each session. The first participant was not always excited to be coming down to the resource room, he enjoyed being up in his general education classroom with his peers, but when the intervention began he was willing to work. The second participant was always enthusiastic about participating in the study and enjoyed coming down to the resource room.

The work by Wexler and colleagues (2010) has shown that the repeated reading intervention has had a positive effect on the fluency and accuracy of an elementary student. The first author modeled the intervention after the study that was completed by Lo et al., (2011). The present classroom study adds to the body of literature that provides evidence based support for using the repeated reading intervention with elementary aged students with learning disabilities. The two participants showed improvement in both their accuracy and fluency of reading a passage at their independent reading level.

Suggestions and Recommendations

The present study had several limitations. The two participants showed improvement but to see if the skill would generalize the first author would have liked to have used a text from a different subject area, such as social studies or science. There were only two participants in this study. By including three or more students with at different reading (and age levels) would have added to our confidence regarding the efficacy of repeated readings (Horner, Carr, Halle, McGee, Odom, & Wolery, 2005). Horner et al. recommend a minimum of three participants as a manner to determine the strength of single case research.

The rapid return to baseline levels for cold reads remains an issue, while the intervention was effective when it was implemented the skill was not maintained once the intervention was removed. An ABA design was selected for the intervention to see if the skill maintained for the cold read of a passage, and maintenance to treatment effects was not found. Unfortunately, our results showed an immediate decline in reading performance. Due to the time constraints it was not possible to implement another repeated readings phase. If the study was replicated in the future it would be important to carry out another repeated readings phase. It may well be that the short duration of the first repeated reading condition contributed to this finding.

Employing different passages with 80% of the text being composed of words from the words encountered in repeated reading could improve maintenance of treatment effects over time. By actively programming for generalization or response maintenance through either word selection or having an extended time period where repeated readings were employed, the first author felt that they could improve maintenance of treatment affects over time. Most behavioral educators have postulated that “trapping” should occur with a skill such as reading because it is required in so many academic areas of the curricula (Alberto & Troutman, 2012; Daly et al., 2005; McLaughlin, B. Williams, R. Williams, Peck, Derby, Bjordahl, & Weber, 1999). Trapping implies that once the student learns a skill in one setting the goal is to have that skill be replicated in other academic and non-academic settings. In the present case, no such outcome was found. This also fails to replicate Lo et al. (2011) and other first authors who have found such an outcome using repeated readings. It appears that additional research needs to answer such a critical and important issues (Stokes & Baer, 1977).

Another limitation was the variability of student performance. For one of the participants there was a greater change in words correct per minute compared to the other participant. There was not the same discrepancy for the accuracy rate. The first participant increased his wpm from an average of 87.7 wpm in baseline conditions to an average of 117.6 wpm during the intervention.

This was an average increase of 30 wpm. The second participant, while reading less wpm than the first participant, increased the average number of wpm from 62 wpm in baseline to 105.6 wpm during the intervention. This is an increase of 43.6 wpm. The second participant participated in more sessions with the first author which would explain the greater increase in her wpm than the first participant. The first participant started the study as a stronger reader than the first participant and was reading close to grade level material while the second participant read material that was a grade level below. The two participants maintained, on average, the same level of accuracy.

The repeated reading intervention was successful but was also practical in implementation and function. The intervention was not difficult to implement and only took a few minutes each session. It is something a classroom teacher could implement or an aid in the classroom. The participant could also implement this intervention on their own, timing themselves and tracking their words read per minute. Students could work in pairs too, timing each other and tracking how many words the other student read per minute. This intervention showed an increase in reading performance but once the conditions returned to baseline the reading performances decreased. This showed the first author that this intervention is one that would have to be continued for an extended period to see if the skill would be maintained.

The special education teacher was pleased with the intervention. The participants were both close to achieving their IEP reading goals. Their general education classroom teacher was also pleased with how well the participants were doing in reading. This is an intervention the special education teacher plans on continuing to use this intervention with the participants and other students who come down to the resource room.

The participants thoroughly enjoyed this intervention and the success they saw from it. The two participants were able to tell the first author what the purpose of the intervention was and how it was going to help them with their reading. The ability to vocalize their opinions on the intervention allowed the first author to see that this was an intervention that not only was effective but also enjoyable for the participants.

After the intervention was over the participants still wanted to take part in the intervention, even after the first author was done working with both of the participants. The first author was very pleased with this reaction; it showed the first author that they enjoyed the intervention. Seeing the success the intervention had on the reading performance of the participants was positive for the first author.

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