The Effect of a Multisensory Approach on Increasing Sight Word Acquisition and Fluency in First Grade Students

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Abstract

The purpose of this study was to determine the effects of a multisensory approach on sight word acquisition and fluency in first grade students. A pretest-posttest treatment-control group design was used with two groups of first-grade students, each formed by random assignment. One group of students, the control group, received traditional sight word instruction while the second group of students, the treatment group, received sight word instruction via a multisensory approach that incorporated visual, audio, tactile, and kinesthetic learning styles. The instrument used in this study was the First 100 Fry Words. The students had two minutes to correctly identify as many of the First 100 Fry Words as they could without hesitation (i.e., within 5 seconds of seeing the word). The words that were unknown to each participant were chosen as the target words for the length of the study. Each week, the students received a list of ten target words to practice. At the end of the week, the students were assessed and any words that were not mastered by all students were used again the next week. Words that were mastered were removed and new words from the target list were added to create a total of ten words for the week. A two-sample *t*-test assessed the difference between the treatment and control population means on the pretest and four subsequent null hypothesis tests. The null hypothesis could not be rejected as the students in the treatment group did not make differential statistically significant gains in sight word acquisition and fluency compared with the control. Future research should continue to provide researchers and educators with more information on the use of a multisensory approach when developing sight word acquisition and fluency.

CHAPTER I

INTRODUCTION

Overview

Reading is an essential skill that children must learn to become successful in school and ensure long-term success in the future. To become fluent and proficient readers, children must acquire a variety of foundational skills (e.g., print concepts, phonemic awareness, phonics, sight word recognition, etc.) during their early years. The success that children have in these areas is predictive of the success that they will have in later literacy achievement (Brown, 2014). Research has shown that approximately 20% of children in the primary grades have difficulty grasping one or more of the skills essential to becoming a proficient reader. As a result, these children often fall behind their classmates and continue to struggle with reading throughout their remaining school years (Toste, Compton, Fuchs, Fuchs, Gilbert, Cho, Barquero, & Bouton, 2014).

One of the foundational skills that many students struggle with is the ability to recognize sight words automatically. According to Brown (2014), this skill is essential as most sight words are phonetically irregular (i.e., words that cannot be decoded and do not follow the traditional English spelling rules). When students are unable to recognize these words quickly, they must focus on reading each word individually instead of shifting their focus to the meaning of the passage (Pullen, Lane, & Monaghan, 2004). However, identifying students who are struggling with this skill and providing them with the necessary interventions can improve the likelihood of positive learning outcomes (Toste et al., 2014).

As an early childhood educator, this investigator is in the midst of teaching children to read each and every day. Sight word acquisition is a critical part of a child's ability to read, not

only because sight words are used so frequently, but also because many of them cannot be decoded. By eliminating the need to decode these words, students can increase their fluency skills by spending more time on decodable text and phonetic patterns. This also increases the amount of time and energy that students can use to focus on the text's meaning, resulting in increased comprehension.

Statement of Problem

The purpose of this study is to determine the effects of a multisensory approach on sight word acquisition and fluency in first grade students.

Hypothesis

The null hypothesis is that the development of sight word acquisition and fluency in first grade students who are instructed using a multisensory approach is not significantly different than the development of sight word acquisition and fluency in first grade students who receive traditional sight word instruction.

Operational Definitions

The independent variable in this study is the use of a ***multisensory approach***. This approach is defined as a combination of activities that incorporated visual, audio, tactile, and kinesthetic learning styles. The activities included watching and listening to sight word songs, sky writing, writing words on a textured surface (e.g., sand or shaving cream), and participating in kinesthetic-based chants and cheers. The dependent variable in this study is the amount of sight words that the students had acquired and the speed in which they could recognize them (***fluency***). This is assessed using a pretest-posttest format to determine the increase in the amount of sight words a student could read without hesitation in two minutes.

CHAPTER II

REVIEW OF THE LITERATURE

Overview

Reading is one of the most important skills that students need to ensure long-term academic success. To become fluent and proficient readers, students must acquire a variety of foundational skills, one of which is to recognize sight words automatically (Brown, 2014). This literature review has three main emphases: (a) examine why sight word acquisition and fluency is necessary for reading proficiency, (b) identify the specific challenges students face when attempting to master sight word recognition, and (c) describe several methods that can be used by educators to support the learning and retention of sight words. Section one of this literature review will focus on the importance of sight word acquisition and fluency in student reading proficiency, section two will explain the challenges that students experience in acquiring and retaining sight words, and finally, section three will explain an assortment of methods that can be used to improve sight word acquisition and fluency.

Importance of Sight Word Acquisition and Fluency

Early reading skills, often referred to as foundational skills, are critical in a student's learning process when attempting to read. Foundational skills serve as building blocks. Without these core skills, students will find it increasingly more difficult to achieve proficiency at the higher reading levels. According to Brown (2014), one of the key foundational skills that students need to be successful readers is the knowledge of high-frequency words. High-frequency words, also known as sight words, are described as the most common words that students should be able to read quickly and automatically as many of them are phonetically irregular (i.e., words that cannot be decoded and do not follow the traditional English spelling

rules). When students are able to quickly recognize these words, they can shift their focus to the meaning of the passage that they are reading instead of focusing on each word individually (Pullen, Lane, & Monaghan, 2004).

Research shows that there is a clear link between fluency and comprehension, so much so that the differences in comprehension between proficient and poor readers can often be credited to the differences in their abilities to automatically recognize words (Pullen et al., 2004). When students first begin to read, they use a considerable amount of effort to decode words and recognize sight words. However, as students develop their reading abilities, these skills become automatic. This allows students to use their cognitive resources to construct meaning and comprehend the text.

If students do not acquire these skills during their early years, they will continue to spend much of their time identifying and decoding the words they are reading. This may disrupt their fluency and interfere with their comprehension of the text (Bashir & Hook, 2009). Therefore, sight word acquisition must become automatic in order for students to become fluent readers. Once students are fluent readers, their effort can be shifted from decoding and recognizing individual sight words to comprehending the greater meaning behind several lines of text from which they are reading. This ability to assign meaning to the text as they read leads to the ultimate goal of both fluency and comprehension, allowing the students to continue to develop and achieve higher reading levels.

Challenges in Sight Word Acquisition and Retention

Each student's unique learning style presents a variety of challenges that must be accounted for when an educator plans their strategy to introduce the retention and acquisition of sight words. There are three challenges that most commonly arise as students begin to develop

their word recognition skills. These challenges include pre-existing deficiencies in their early literacy skills, literacy based in a foreign language, and a lack of behavioral attention skills.

Deficient Early Literacy Skills

Acquiring sight words and identifying them fluently can be demanding for many beginning readers. However, if students have not developed early literacy skills (e.g., alphabet knowledge, phonological awareness, rapid automatic naming of letters or numbers, etc.) before beginning school, the ability to develop word recognition skills becomes an even greater challenge. When this occurs, educators must first provide differentiated instruction that meets the diverse needs of the students. Only once students have built a solid foundation of early literacy skills can they shift their focus to developing more advanced sight word recognition. As a result, research has shown that students who do not master early literacy skills before beginning school are at a greater risk for falling behind their classmates, exhibiting below grade-level reading skills and comprehension (Brown, 2014).

Language Background

When students are English-language learners (ELLs), they may find it increasingly difficult to recognize and retain sight words for several reasons. Many ELLs, especially those who have recently immigrated from another country, have difficulty acquiring sight words as they are not familiar with English syntax, phonology, or vocabulary. Additionally, the ability of ELLs to acquire sight words greatly depends on their oral language proficiency. If students do not have a certain word in their oral vocabulary, they will be unable to read it. The final challenge that ELLs face is that a majority of sight words do not have easily associated visuals, consequently, it can be difficult for students to give meaning to those words (Helman & Burns, 2008). As a result, ELLs often require extra support from educators and more time to acquire and

understand sight words.

Behavior and Attention

Another factor that can challenge a students' ability to acquire and retain sight words manifests with behavioral and attention difficulties. Students who display behavioral and attention deficiencies exhibit lower levels of reading achievement attributed to their difficulty paying attention to instruction and maintaining focus on relevant information. This lack of focus directly impacts their ability to identify each item on their list of sight words. Finally, the lack of focus and attention significantly reduces a students' cognitive resources, decreasing the likelihood of successfully accomplishing a particular reading task (Miller, Fuchs, Fuchs, Compton, Kearns, Zhang, & Kirchner, 2014). Students with behavior and attention difficulties often require educators to provide constant redirection to help them self-regulate and stay on task, which detracts attention from focusing on skill development.

Methods to Improve Sight Word Acquisition and Fluency

Researchers and educators recognize the importance of sight word acquisition and fluency. Many methods have been studied and used in classrooms to help students develop this necessary skill. The four most commonly used methods in primary classrooms to help students improve their sight word acquisition and fluency are the flashcard method, the picture-based method, the game-based method, and the multisensory method.

Flashcard Method

The first method used to improve students' sight word acquisition and fluency is the flashcard method. This method is most common as it provides educators with a convenient and simple format to introduce and practice sight words (Kupzyk, Daly, & Andersen, 2011). Traditional Drill (TD) is one of two main flashcard methods, this approach uses a set of sight

words that are entirely unknown to the student. To begin, the educator models the pronunciation of the sight words and asks the student to repeat them. The student is then shown the flashcards again and asked to independently read the words as the educator provides feedback. This cycle continues until the student has mastered all of the unknown words.

Alternatively, some educators have found that combining known sight words with unknown sight words can improve a student's recognition and retention. This flashcard method, known as Incremental Rehearsal (IR), increases motivation and task completion rates. Incremental Rehearsal is similar to TD, except the educator presents nine known sight words for each unknown sight word. The words are practiced until the previously unknown word becomes a known word (January, Lovelace, Foster, & Ardoin, 2017). Although IR has been proven to be the more effective flashcard method, it has disadvantages as well. For instance, the amount of time that it takes for a student to acquire unknown sight words is not as efficient as TD as the procedures are much lengthier (Volpe, Mulé, Briesch, Joseph, & Burns, 2011).

Volpe et al., (2011), conducted an additional study to compare the effectiveness and efficiency of the two methods (TD and IR). Four six-year old students were instructed using an equal amount of TD and IR sessions over a four-week span. When the instruction was complete, the researchers found that the differences in effectiveness between TD and IR were minimal. Despite the similar effectiveness, researchers also found that the TD method was unanimously more efficient than the IR method as supported by previous research. In addition, a survey of the participants found an even split amongst the students who preferred one method over the other. Although IR was previously found to be slightly more effective, TD benefits from a drastic increase in efficiency, providing a significant benefit in situations where students are tasked to acquire several new sight words in a short period of time.

Picture-Based Method

Picture communication symbols (PCS) are another method that can be used to improve students' sight word acquisition and fluency. Using this method, students are provided with a set of cards, on each of the cards a sight word and corresponding PCS is written. Although this method is frequently used in primary classrooms, past research does not support its effectiveness. According to Meadan, Stoner, and Parette (2008), less efficient learning occurs when new sight words are accompanied by related PCS. When the sight words are introduced with a corresponding PCS, students require a longer amount of time to acquire new sight words compared to those learning sight words in isolation. This inefficiency may be attributed to a students' formed dependency on the PCS.

Meadan et al., (2008), conducted an additional study to determine if providing written words with PCS would increase the amount of sight words that students can identify. To do this, they placed four- and five-year olds at-risk in reading into two separate groups, a control group, and an intervention group. The control group received sight word instruction through the use of games that only used written words. The intervention group used the same games; however, their written words were accompanied by corresponding PCS. After completing the study, these researchers found that their results supported the previous research as the students in the control group showed a greater improvement in their abilities to identify sight words on assessments that did not include pictures. When the pictures were included on the assessment, the intervention group was more successful, however, having sight words accompanied by PCS is not something students will encounter while reading on a regular basis.

Game-Based Method

Today's students live in a fast-paced world that is always changing. As a result, educators are challenged to modernize teaching methodologies and keep students engaged. One way that educators can accomplish this is through game-based learning which motivates students to learn and encourages them to challenge themselves. A research-based game that educators can use to improve sight word acquisition and fluency is Reading Racetracks, as it was created to improve fluency in reading. In this game, students are provided with a gameboard that looks like a racetrack. Within the racetrack, selected sight words (known and unknown) are printed in a random order. As the students go around the racetrack and read as many of the words as they can, the educator times the student and makes note of any errors (Kaufman, McLaughlin, Derby, & Waco, 2011).

Two studies have been done to determine if Reading Racetracks needs to be implemented in conjunction with flashcards. In the study conducted by Kaufman et al., (2011), the researchers found that using the racetrack without flashcards impacted the students' ability to develop fluency in sight word identification, because the educator would have to stop the student to provide correct pronunciation when a word was misread or unrecognized. The study found that the effectiveness of Reading Racetracks was improved when the sight words were introduced with flashcards prior to the game. McGrath, McLaughlin, Derby, and Bucknell (2012), conducted a similar study and found that their outcomes suggested that the use of flashcards may not be necessary, but further research would need to be conducted. Overall, Reading Racetracks is an engaging method to improve sight word acquisition and fluency however, it does seem to require other instructional methods (e.g., flashcards) in order for students to fully benefit.

Multisensory Method

Students learn in a variety of ways, some benefit from introducing new words and concepts orally, while others prefer to see a visual representation. To support the learning style of a diverse group of students, educators can use the multisensory approach, which involves the use of visual, auditory, and kinesthetic-tactile movements to improve the sight word acquisition and fluency of their students. Several techniques used in the multisensory approach include drawing pictures, sky writing, writing words on a textured surface (e.g., sand or shaving cream), mnemonic devices, and hands-on visuals and kinesthetic movements associated with Reading Racetrack, a method previously discussed. Research has shown that when students have the opportunity to learn using more than one sense, the information is more likely to be internalized (Phillips & Feng, 2012).

Phillips and Feng (2012), conducted a study to determine the effectiveness of the multisensory approach with sight word recognition compared to the traditional flashcard approach. To do this, the researchers first introduced five sight words to a group of five- and six-year olds using the traditional flashcard approach. After practicing the words for two weeks, the researchers introduced five new sight words using the multisensory approach (e.g., sky writing, writing on a bumpy surface, chopping the words on their arms, etc.). When the study was complete, the researchers found that the participants learned more sight words using the multisensory approach which can be attributed to the active engagement and interaction students have with sight words. Additionally, the participants completed a survey and it was found that the multisensory approach was the preferred method of instruction. Ultimately, a multisensory approach is capable of successfully meeting the needs of a diverse group of students, each of which can find academic success by encouraging them to follow their own path of learning.

Summary

Sight word acquisition and fluency are foundational skills needed for students to become proficient readers. Sight word acquisition and fluency allows the reader to focus on comprehending the text, rather than decoding and identifying the words. As a result, teachers must be aware of the importance of sight word acquisition and fluency, why students may have difficulty developing this skill, and what methods are available to support the diverse needs of all students.

CHAPTER III

METHODS

Design

The purpose of this study was to assess the effectiveness of a multisensory approach to increase sight word acquisition and fluency in first-grade students. A pretest-posttest treatment-control group design was used for this research where students were given a pretest in February and a posttest in March. Two groups of first-grade students, each formed by random assignment, were assessed in this study. One group of students, the control group, received traditional sight word instruction that was pre-determined by the first-grade curriculum (i.e., using the "read-spell-read" method in conjunction with flashcards). The second group of students, the treatment group, received sight word instruction via a multisensory approach that incorporated visual, audio, tactile, and kinesthetic learning styles. The pretest and posttest, which was a list of the First 100 Fry Words, was presented to both groups of students. Each time, the students were given two minutes to identify as many of the words as they could. The pretest-posttest design was used to determine whether or not there was a significant difference in students' ability to identify sight words after being instructed using a multisensory approach. The independent variable was the use of a multisensory approach (i.e., visual, audio, tactile, and kinesthetic activities). The dependent variable was the amount of sight words that the students had acquired and the speed in which they could recognize them (fluency).

Participants

The participants for the study consisted of ten first-grade students in a Title I elementary school on the West Coast. The participants were chosen from a convenience sample as they were in the researcher's classroom, however, they were selected based on difficulties in reading and

difficulty in acquiring sight words. The ten participants were randomly placed into two groups (i.e., the control group and the treatment group). The control group received traditional sight word instruction while the treatment group received sight word instruction via a multisensory approach that incorporated visual, audio, tactile, and kinesthetic learning styles. The subjects in the control group consisted of two males and three females, one of which received ESOL services. Two students were Caucasian, two students were Hispanic, and one student was Biracial. The subjects in the treatment group consisted of three males and two females. One student had an Individualized Education Plan (IEP) and one student received speech services. Two students were Caucasian, two students were Hispanic, and one student was Biracial.

Instrument

The instrument used in the study was a pretest and posttest using the First 100 Fry Words. The First 100 Fry Words is a list of the 100 most frequently occurring words in the English language. These words should be recognized automatically by readers. Unlike many other sight word lists, Fry Words are not administered in alphabetic order. Instead, they are administered in the order of frequency (e.g., the, of, and, a, to, in, etc.). The pretest and posttest were both administered in a one-on-one format. Each time, the students had two minutes to correctly identify as many of the First 100 Fry Words as they could without hesitation (i.e., within 5 seconds of seeing the word). If the students correctly identified a word, they were given one point and if they were unable to identify a word, they were given zero points. Though the First 100 Fry Words are commonly used among educators, there is no reliability or validity data for the word list when used as an assessment instrument.

Procedure

Before beginning the study, the researcher assessed the participants' knowledge of the First 100 Fry Words (refer to Appendix A to view the word list). The words that were unknown to each participant were chosen as the target words for the length of the study. Each week, the students received a list of ten target words to practice. At the end of the week, the students were assessed and any words that were not mastered by all students were used again the next week. Words that were mastered were removed and new words from the target list were added to create a total of ten words for the week. Throughout the study, previously mastered words were revisited intermittently to ensure that they were not forgotten.

To begin the study, the ten participants were randomly placed into two groups (i.e., the control group and the treatment group). Each week, the students in the control group were given a list of target words and received traditional sight word instruction that was pre-determined by the first-grade curriculum (i.e., using the "read-spell-read" method in conjunction with flashcards). Using this method of instruction, the researcher would display a flashcard and the students would read the word, spell the word, and read the word again. The researcher's role was to provide correct pronunciation when a word was misread or unrecognized.

At the same time, the students in the treatment group were also given a list of target words, however, they received sight word instruction via a multisensory approach that incorporated visual, audio, tactile, and kinesthetic learning styles. On Mondays, the researcher introduced the new words to the students. As each word was introduced, the students would repeat the word together. They would then spell the word aloud while writing each letter in the air. Finally, they would reread the word after spelling it. On Tuesdays, the students would participate in a variety of kinesthetic-based chants and cheers for each target word. For instance,

the students would start in a crouching position. As they said each letter of the word, they would stand up taller each time. Finally, when they finished spelling the word, the students would jump in the air and say the word. On Wednesdays, the students would practice spelling the target words on a textured surface. The students had the choice of using sand or shaving cream. On Thursdays, the students would play musical sight words. Each of the target words, as well as previously mastered words, were written on index cards. While music played, the students had to pass the index cards around the circle. When the music stopped, each student had to read the word on their index card. The game continued until all of the target words were reviewed. On Fridays, the students were assessed one-on-one and any words that were not mastered by all students were included as target words for the following week.

At the conclusion of the six-week study, the students in both the control and treatment group were given the posttest. Again, the students had two minutes to correctly identify as many of the First 100 Fry Words as they could without hesitation (i.e., within 5 seconds of seeing the word). The scores from the posttests were compared to determine if the students receiving sight word instruction via a multisensory approach outperformed the students who did not.

Analysis Plan

The two-sample t-test assessed the difference between the treatment and control population means on the pretest and posttest. The customary alpha level of 0.05 was used to maintain a 5% chance of a false positive if the null hypothesis of no mean difference was rejected. The theoretical population consists of all classrooms with similar students to the study class wherever they exist. Sample sizes of 5 students in each group may result in population mean differences going undetected by the statistical test due to low power. Therefore, Cohen's Effect Size was applied to the pre and posttest data. Effect size measures the treatment impact on

outcomes regardless of sample size.

CHAPTER IV

RESULTS

This study assessed the effectiveness of a multisensory approach to increase sight word acquisition and fluency in first-grade students. Two groups of first-grade students, each formed by random assignment, were assessed in this study. One group of students, the control group, received traditional sight word instruction that was pre-determined by the first-grade curriculum (i.e., using the "read-spell-read" method in conjunction with flashcards). The second group of students, the treatment group, received sight word instruction via a multisensory approach that incorporated visual, audio, tactile, and kinesthetic learning styles.

The two-sample *t*-test assessed the difference between the treatment and control population means on the pretest and four subsequent null hypothesis tests. The customary alpha level of 0.05 was used to help determine if the sample results supported the alternative hypothesis. The theoretical population consists of all first-grade classrooms with similar students to the study class, wherever they may exist. Sample sizes of five students in each group may result in population mean differences going undetected as the hypothesis test lacks sufficient power to differentiate between the treatment and controls. Therefore, Cohen's Effect Size was applied to the data to measure the treatment impact on outcomes regardless of sample size. The summary of the null hypothesis tests is shown in Table 1, while Tables 2 – 6 provide additional details of each null hypothesis test and effect size.

The null hypothesis could not be rejected for the pre-treatment week or throughout the implementation of the treatment (weeks 1 – 4) at the customary alpha level of 0.05. Moreover, liberalizing alpha to 0.10 or 0.20 would not allow choosing the alternative hypothesis with any defensible degree of reliability. In addition, the effect sizes were very small for the pre-treatment

week and small for weeks 1 – 4 of the treatment. There was no evidence of differential treatment effect on sight word acquisition, even after accounting for the sample size. Both the control and treatment samples had remarkable gains in sight word acquisition from the pre-treatment week into week 1. In weeks 1 and 4, the treatment group outscored the control group. In weeks 2 and 3, however, the control group averaged higher than the treatment group. Figure 1 displays the weekly mean sight word scores for each sample. The findings from this study and the implications from the data collected will be compared, interpreted, and discussed in the following chapter.

Figure 1

Mean Scores for Pre-Week through Weeks 1 – 4

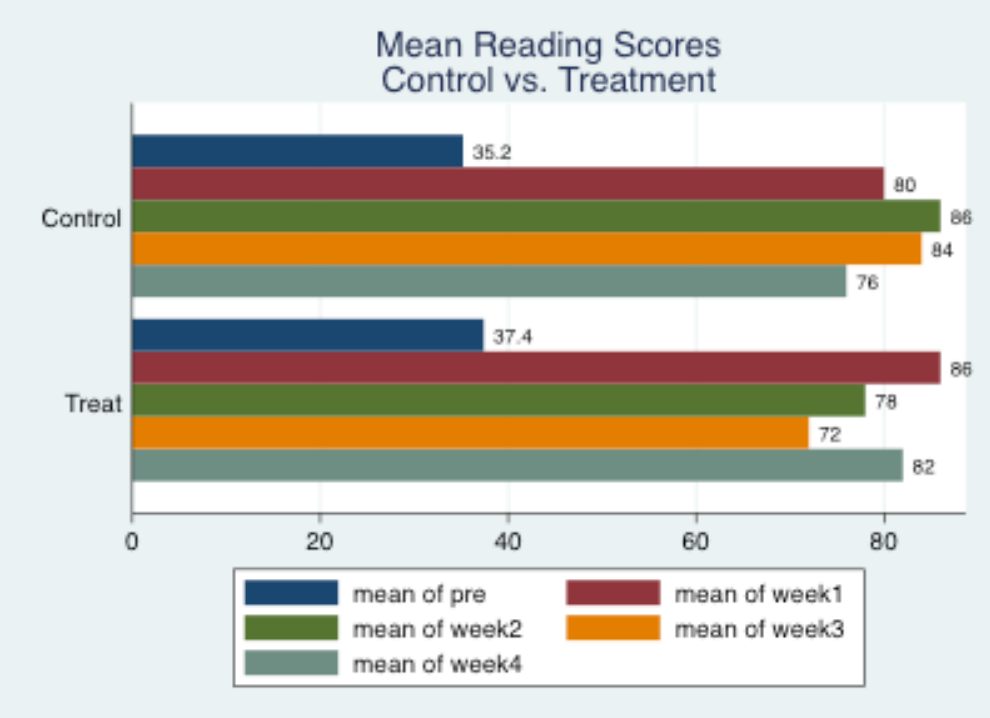

Table 1

Summary of the Null Hypothesis Tests

	Mean Score					
Time	Control	Treatment	t-test	p-value	Decision	Effect Size
Pre	35.2	37.4	0.19	0.86	Null	.12, very small
Week 1	80.0	86.0	0.38	0.71	Null	.24, small
Week 2	86.0	78.0	0.45	0.67	Null	.28, small
Week 3	84.0	72.0	0.68	0.51	Null	.43, small
Week 4	76.0	82.0	0.38	0.71	Null	.24, small

Table 2

Pre-Week Null Hypothesis Test

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	5	80	7.071068	15.81139	60.36757	99.63243
1	5	86	14	31.30495	47.12977	124.8702
combined	10	83	7.46101	23.59378	66.12202	99.87798
diff		-6	15.68439		-42.16826	30.16826

diff = mean(0) - mean(1) t = -0.3825
Ho: diff = 0 degrees of freedom = 8

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.3560 Pr(|T| > |t|) = 0.7120 Pr(T > t) = 0.6440

```
. esize twosample week1, by(ngroup) cohensd
```

Effect size based on mean comparison

Obs per group:
ngroup==0 = 5
ngroup==1 = 5

Effect Size	Estimate	[95% Conf.	Interval]
Cohen's *d*	-.2419434	-1.479645	1.010475

Table 3

Week 1 Null Hypothesis Test

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	5	35.2	7.472617	16.70928	14.45269	55.94731
1	5	37.4	9.042124	20.2188	12.29504	62.50496
combined	10	36.3	5.541861	17.5249	23.76344	48.83656
diff		-2.2	11.7303		-29.25013	24.85013

diff = mean(0) - mean(1) t = -0.1875
Ho: diff = 0 degrees of freedom = 8

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.4280 Pr(|T| > |t|) = 0.8559 Pr(T > t) = 0.5720

```
. esize twosample pre, by(ngroup) cohensd
```

Effect size based on mean comparison

Obs per group:
ngroup==0 = 5
ngroup==1 = 5

Effect Size	Estimate	[95% Conf.	Interval]
Cohen's *d*	-.1186161	-1.355891	1.125923

Table 4

Week 2 Null Hypothesis Test

```
Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	5	86	9.797959	21.9089	58.7965	113.2035
1	5	78	14.96663	33.4664	36.44597	119.554
combined	10	82	8.537499	26.99794	62.68684	101.3132
diff		8	17.88854		-33.25106	49.25106

```
    diff = mean(0) - mean(1)                                      t =   0.4472
Ho: diff = 0                     degrees of freedom =        8

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.6667         Pr(|T| > |t|) = 0.6666          Pr(T > t) = 0.3333
```

```
. esize twosample week2, by(ngroup) cohensd

Effect size based on mean comparison

                                Obs per group:
                                    ngroup==0 =      5
                                    ngroup==1 =      5
```

Effect Size	Estimate	[95% Conf.	Interval]
Cohen's *d*	.2828427	-.972791	1.521328

Table 5

Week 3 Null Hypothesis Test

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	5	84	9.273618	20.73644	58.25231	109.7477
1	5	72	14.96663	33.4664	30.44597	113.554
combined	10	78	8.537499	26.99794	58.68684	97.31316
diff		12	17.60682		-28.60139	52.60139

diff = mean(0) - mean(1) t = 0.6816
Ho: diff = 0 degrees of freedom = 8

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.7426 Pr(|T| > |t|) = 0.5148 Pr(T > t) = 0.2574

```
. esize twosample week3, by(ngroup) cohensd
```

Effect size based on mean comparison

Obs per group:
ngroup==0 = 5
ngroup==1 = 5

Effect Size	Estimate	[95% Conf.	Interval]
Cohen's *d*	.4310527	-.8386769	1.675063

Table 6

Week 4 Null Hypothesis Test

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
0	5	76	8.124038	18.1659	53.44405	98.55595
1	5	82	13.56466	30.3315	44.33847	119.6615
combined	10	79	7.520343	23.78141	61.9878	96.0122
diff		-6	15.81139		-42.46113	30.46113

diff = mean(0) - mean(1) t = -0.3795
Ho: diff = 0 degrees of freedom = 8

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.3571 Pr(|T| > |t|) = 0.7142 Pr(T > t) = 0.6429

```
. esize twosample week4, by(ngroup) cohensd
```

Effect size based on mean comparison

Obs per group:
ngroup==0 = 5
ngroup==1 = 5

Effect Size	Estimate	[95% Conf.	Interval]
Cohen's *d*	-.24	-1.477672	1.012273

CHAPTER V

DISCUSSION

The null hypothesis stated that the development of sight word acquisition and fluency in first grade students who are instructed using a multisensory approach is not significantly different than the development of sight word acquisition and fluency in first grade students who receive regular sight word instruction. This hypothesis could not be rejected by the results of the study.

Implications of the Results

The results of this study suggest that teaching sight words in a small group setting is beneficial to students, regardless of the instructional approach used (i.e. multisensory or traditional). Students in both the control and treatment groups made remarkable gains from the pre-treatment week into week 1. In weeks 1 and 4, the treatment group outscored the control group. However, in weeks 2 and 3, the control group averaged higher than the treatment group. Although the growth of the students in the treatment group was not statistically significant compared to the control group, it is important to note that the treatment group was much more motivated by the multisensory activities. Each student was excited to participate and remained engaged throughout the entirety of each activity. Conversely, the students in the control group seemed lackadaisical at times and would frequently ask when they were going to get the opportunity to do one of the multisensory activities. Nonetheless, motivation did not always translate to better achievement in this study.

Theoretical Consequences

Reading is one of the most important skills that students need to ensure long-term academic success. To become fluent and proficient readers, research has shown that students

must acquire a variety of foundational skills, one of which is to recognize sight words automatically (Brown, 2014). When students are able to do this, they can shift their focus to the meaning of the passage that they are reading instead of focusing on each word individually (Pullen, Lane, & Monaghan, 2004).

Each student's unique learning style presents a variety of challenges that must be accounted for when educators plan which instructional strategies they will use to teach sight words. One way that educators can support the differing learning styles of students is by using a multisensory approach as research has shown that when students have the opportunity to learn using more than one sense, the information is more likely to be internalized. Additionally, researchers have found that students prefer the multisensory approach due to the active engagement and interaction that they have with sight words (Phillips & Feng, 2012). Although the growth of the students in the treatment group was not statistically significant compared to the control group, the current findings support this research because the students in the treatment group were highly motivated by the multisensory activities. Each student was excited to participate and was engaged in each activity which resulted in an increase in sight word knowledge.

Threats to Validity

Though the data shows that there was an increase in the students' sight word acquisition in both the control and treatment group, there were validity concerns.

External Threats

One external threat to validity was the sample population. The participants for this study were chosen from a convenience sample and were only chosen if they were identified as having difficulties in reading and difficulties in acquiring sight words. The participants did represent a

diverse population of gender and ethnicity, but they were all from the same school, grade, and classroom. Consequently, the results cannot be generalized to other populations such as younger/older students or average/above average readers. A second external threat to validity was the size of the sample as it only included a small number of students. Increasing the sample size would provide more statistical power and make it easier to differentiate between the treatment group and control group were there a treatment effect in the population (classrooms similar to the study group).

Internal Threats

This study also had multiple internal threats to validity. One of these threats was the consistency in which the participants received sight word instruction. When students were absent from school throughout the study, they were unable to receive new sight word instruction and/or retain sight words through repetition and practice. Additionally, when unexpected events such as assemblies and fire drills occurred, daily schedules were altered, and students were not able to participate in their sight word groups. Another internal threat was that some students received additional practice and exposure to sight words at home with their families. The final internal threat to validity was the unexpected closure of schools due to COVID-19. As a result of school closures, the study had to be stopped two weeks early and the final posttest could not be given. Conducting this study for the full six weeks may have led to a significant difference between the control and treatment group and the null hypothesis being rejected.

Connections to Previous Studies/Existing Literature

This study was comparable to one conducted by Phillips and Feng (2012). Both studies attempted to determine the effectiveness of using the multisensory approach to increase sight word recognition compared to the traditional flashcard approach, however, the procedures were

slightly different. These researchers first introduced five sight words to a group of five- and six-year olds using the traditional flashcard approach. After practicing the words for two weeks, the researchers introduced five new sight words using the multisensory approach (e.g., sky writing, writing on a bumpy surface, chopping the words on their arms, etc.). In this project, the researcher assessed two groups of first-grade students, each formed by random assignment. One group of students, the control group, received regular sight word instruction that was pre-determined by the first-grade curriculum (i.e., using the "read-spell-read" method in conjunction with flashcards). The second group of students, the treatment group, received sight word instruction via a multisensory approach that incorporated visual, audio, tactile, and kinesthetic learning styles. Each week, the students received a list of ten target words to practice. At the end of the week, the students were assessed and any words that were not mastered by all students were used again the next week. Words that were mastered were removed and new words from the target list were added to create a total of ten words for the week.

When the study was complete, Phillips and Feng (2012) found that their participants learned more sight words using the multisensory approach which they attributed to the active engagement and interaction students had with sight words. This data does not support the findings in this action research project as there were two weeks when the control group performed better and two weeks when the treatment group performed better. However, the results of both studies showed that the participants preferred the multisensory approach as it was highly motivating and engaging.

Implications for Future Research

In the future, this study could be conducted again with various improvements. First, the researcher could use a larger sample size that is comprised of various demographics and skill

levels. Since students are exposed to sight words in each of the primary grades, the study could be expanded to include pre-kindergarten – third grade students. Having a larger sample with more varied participants could provide more statistical power and make it easier to differentiate between the treatment group and control group. In the future, the researcher could also conduct the study for a longer period of time. This study, which was supposed to be conducted for six weeks, was only conducted for four weeks due to extenuating circumstances. Increasing the length of the study may help increase students' sight word recognition as it would allow for more instructional time and for more words to be included.

Conclusion

Though the null hypothesis for this research could not be rejected, students in both the control and treatment group made gains in their sight word acquisition which suggests that teaching sight words in a small group setting is beneficial to students, regardless of the instructional approach used. However, it is important for educators to note that students were highly motivated by the multisensory activities. If educators are looking to increase the engagement in their classrooms, they may want to choose the multisensory approach. Additional research should be conducted with a larger sample size and over a longer period of time to provide researchers and educators with more information on the use of a multisensory approach when developing sight word acquisition and fluency.

Appendix A

the	or	will	number
of	one	up	no
and	had	other	way
a	by	about	could
to	words	out	people
in	but	many	my
is	not	then	than
you	what	them	first
that	all	these	water
it	were	so	been
he	we	some	called
was	when	her	who
for	your	would	oil
on	can	make	sit
are	said	like	now
as	there	him	find
with	use	into	long
his	an	time	down
they	each	has	day
I	which	look	did
at	she	two	get
be	do	more	come
this	how	write	made
have	their	go	may
from	if	see	part

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