Singing with sight words: Using music and movement to aid in the acquisition of common sight words

Elena Pepe
Singing with Sight Words:

Using Music and Movement to Aid in the Acquisition of Common Sight Words

By Elena Pepe

A Graduate Field Experience

Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Arts in Urban Education

at Cardinal Stritch University

Milwaukee, Wisconsin

August 2015
Approval page

This Graduate Field Experience
For Elena Pepe
Has been approved for Cardinal
Stritch University by

________________________________
(Advisor)

8/22/15

________________________________
(Date)
Abstract

The following study compared two strategies for teaching at-risk kindergarteners how to read and write grade-level high-frequency words: an experimental strategy using songs and movements and a traditional strategy using flashcards. The researcher hypothesized that the singing strategy would be more effective because the songs provided an additional cue for memorization and that students would be more motivated to learn in the singing condition. Ten students with below-grade-level literacy skills from one urban kindergarten classroom were randomly sorted into the conditions. Performance was measured using a Sight Word Reading Test, a Spelling Assessment, and a survey measuring attitudes towards literacy. The hypothesis was not accepted; however, participants did make significant gains and the experimental group performed slightly better than the control group, particularly in spelling.
# Table of Contents

Approval Page .................................................................................................................. 2  
Abstract ............................................................................................................................ 3  
Table of Contents ............................................................................................................ 4  
List of Tables ................................................................................................................... 6  
List of Figures .................................................................................................................. 7  

**CHAPTER ONE: Introduction** .................................................................................. 8  
  Purpose of the Study ........................................................................................................ 8  
  Description of the Participants ...................................................................................... 9  
  Focus of the Intervention .............................................................................................. 10  
  Glossary of Terms ........................................................................................................ 11  
  Conclusion .................................................................................................................... 12  

**CHAPTER TWO: Review of the Literature** ................................................................. 13  
  Sight Words ................................................................................................................... 13  
  Music and Education .................................................................................................... 31  
  Conclusion .................................................................................................................... 49  

**CHAPTER THREE: Procedures** ............................................................................... 51  
  Pre-test Data Collection ................................................................................................. 51  
  Participants .................................................................................................................... 52  
  Materials ....................................................................................................................... 55  
  Procedures .................................................................................................................... 58  
  Post-test Data Collection ............................................................................................... 64  
  Conclusion .................................................................................................................... 64  

**CHAPTER FOUR: Results** ....................................................................................... 65  
  Sight Word Reading Test Results .................................................................................. 65  
  Sight Word Spelling Assessment Results .................................................................... 70  
  Survey Results ............................................................................................................... 73  
  Conclusion .................................................................................................................... 74
CHAPTER FIVE: Conclusions .................................................................75

Connection to the Literature ..............................................................75
Explanation of Results ......................................................................77
Strengths and Limitations .................................................................80
Recommendations ...........................................................................83
Conclusions .....................................................................................85

References .......................................................................................87

Appendix A: Sight Word Reading Test Recording Sheet ....................92
Appendix B: Literacy Motivation and Confidence Survey ..................93
Appendix C: List of Words for Sight Word Spelling Assessment ........94
Appendix D: Sight Word Song Lyrics and Motions ............................95
## List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Table 3.1: Literacy Data for Intervention Participants</td>
<td>54</td>
</tr>
<tr>
<td>2. Table 3.2: Number of Participants to Correctly Read Each Word on Pre-test</td>
<td>57</td>
</tr>
<tr>
<td>3. Table 3.3: Weekly Schedule</td>
<td>63</td>
</tr>
<tr>
<td>4. Table 4.1: Number of Words Read Correctly by Members of the Experimental Group</td>
<td>68</td>
</tr>
<tr>
<td>5. Table 4.2: Number of Students who Correctly Read Each Word</td>
<td>69</td>
</tr>
<tr>
<td>6. Table 4.3: Number of Words Spelled Correctly by Members of the Experimental Group</td>
<td>72</td>
</tr>
<tr>
<td>7. Table 4.4: Number of Students who Correctly Spelled Each Word</td>
<td>73</td>
</tr>
<tr>
<td>8. Table 4.5: Experimental Participants Responses to Literacy Confidence and Motivation Survey</td>
<td>74</td>
</tr>
</tbody>
</table>
## List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Figures 4.1 and 4.2: A Comparison of Reading Pre-test and Post-test Performance by Group</td>
<td>66</td>
</tr>
<tr>
<td>2. Figure 4.3: A comparison of Spelling Pre-test and Post-test Performance by Group</td>
<td>71</td>
</tr>
</tbody>
</table>
Chapter One: Introduction

This chapter describes the purpose of the study, including the rationale for choosing the participants and the content matter of the intervention. Additionally, it provides a brief description of the students involved in the study, discussing both their strengths and needs and the implications that these have on the study design. At the end of the chapter, there is an overview of the intervention, which links it to relevant Common Core State Standards, as well as a glossary of key terms related to the intervention.

Purpose of the Study

I conducted the study in a self-contained kindergarten (K5) classroom in an urban Christian choice school in a large Midwestern city. The school serves a student population that is predominantly African American and 99% of the students qualify for free or reduced price lunch. As the school does not offer services for special education, very few students have Individualized Education Plans (IEPs). None of the students in the focus classroom had an IEP. Therefore, instead of focusing on Special Education students for the intervention, I targeted students who were performing significantly below grade level. The aim of the study was to explore strategies that could be used to help struggling students catch up to grade level. If students could find strategies that aid their acquisition of key kindergarten skills, they may be able to avoid falling further behind and potentially being placed in Special Education in future years. The use of a control and an experimental group in the intervention was included to determine whether standard teaching procedures were effective or whether there were a more successful way to present material. The intervention focused on Literacy, as reading ability is an
early indicator of students’ future academic success (National School Readiness Indicators Initiative, 2005).

Description of the Participants

Ten students from my classroom participated in the intervention. Nine of the ten students had attended school prior to the current academic year, with many of the students having completed K4 at the same school. All ten of the students had been in the current classroom since the start of the school year in August; therefore, they all came from relatively similar academic backgrounds. The intervention began in April, eight months into the school year. At this point in the year, the ten focus students were performing below grade level, particularly in English Language Arts (ELA). By April, these students had not yet met mid-year targets in reading level, sight word knowledge, or writing skills. The goal of the intervention was to provide students with a dedicated space to review content necessary for meeting mid-year targets and to provide them with confidence and word knowledge that could increase their reading and writing abilities and independence.

Although the students were low in Reading and Writing, they did have a number of academic strengths. For example, almost all students in the study knew all of the letter names and sounds and could apply basic phonics decoding skills when prompted. Therefore, they did not need to review these foundational skills and could focus instead on word learning and reading. Furthermore, these students exhibited high levels of class participation, particularly when activities were interactive and invoked different learning modalities. For these reasons, I conducted the intervention during small-group time, when students could have many opportunities for participation in student-centered learning activities. I also incorporated
activities that addressed different learning styles, particularly when designing the experimental strategy.

**Focus of the Intervention**

For the intervention, I decided to target student acquisition of common **high-frequency words** (sometimes referred to as **sight words**), addressing the Reading Foundations Common Core standard RF.K.3.C: “Read common high-frequency words by sight (e.g., *the, of, to, you, she, my, is, are, do, does*)” (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010). In addition to being able to automatically read high-frequency words, students would also learn how to spell them. I chose to focus on high-frequency words because they are so common in emergent reader books and necessary in early student writing. Having knowledge of several common high frequency words might increase these students’ reading and writing confidence and success, especially considering that traditional **decoding** strategies often do not work with these words. Furthermore, results from a correlation study I conducted in my classroom indicated that there was a significant relationship between the number of sight words known by students and their reading level for members of this class (R= 0.716, significant at the p<.01 level). While correlation cannot prove causation, this strong relationship suggests that having a larger sight vocabulary could be beneficial for early reading. Therefore, the development of students’ sight vocabulary was also intended to help students master standard RF.K.4: “Read emergent-reader texts with purpose and understanding” (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010). Being able to read high-frequency words by sight could free students to focus on decoding less frequent words and on comprehension.
As high-frequency words tend to contain irregular spellings, students often need to memorize them in order to read fluently. Therefore, another aim of the study was to determine strategies that could help kindergarteners memorize words. Given that song is a traditional method for teaching in early childhood settings (for example: the alphabet song), I decided to use music to teach high-frequency words to the experimental group. Song is also commonly thought to be an effective mnemonic device considering that people often have a strong memory for lyrics. Additionally, I was interested in seeing whether using music would increase student motivation. None of the participants had a learning disability; therefore, one reason why these students knew fewer words than the rest of the class might have been due to a lack of interest in learning new words. Perhaps incorporating music into learning would increase student engagement and desire to learn more words. Conversely, these students may have just needed extra practice or teacher feedback and did not require a different strategy to learn words. Therefore, the control group was taught using a traditional flashcard drill method.

**Glossary of Terms**

- **decoding**: a method for reading new words that involves figuring out the sounds that correspond to each letter and blending them together to form a word
- **high-frequency words**: words that are commonly used in the English language and often have irregular spellings
- **sight words**: words that can be read automatically from memory, which often includes high-frequency words

(definitions derived from a publication by the National Reading Panel, 2000)
Conclusion

In the following chapters I will describe my study which investigated the use of music to teach common sight words. I hypothesized that students in the music condition would learn sight words more effectively due to the mnemonic aid provided through song. I also hypothesized that students in the music condition would have improved attitudes towards reading and writing given that music is a fun and interactive way to engage in learning. The independent variable was instruction method: song (the experimental condition) versus no song (the control condition). The dependent variables were performance on a sight word reading test and a sight word spelling test, and responses to a survey about attitudes towards reading and writing. The next chapter will highlight some of the relevant literature which served as a guide for the design of the study.
Chapter Two: Review of the Literature

"Why do we remember countless song lyrics, but not our studies?"

It is a question posed by Jessica Stoller-Conrad (2013), a journalist for the American Association for the Advancement of Science, as well as a frustration felt by many others. However, while song is thought to be an effective memorization strategy in popular culture, research on the effectiveness of song on memorization is inconclusive, especially when considering studies aimed specifically at the kindergarten classroom. Similarly, studies on different approaches to sight word instruction and vocabulary building for early childhood students present varied results. This chapter provides an overview of existing relevant literature, beginning with a discussion about the benefits of teaching sight words and strategies for learning, and ending with an overview of studies examining the interplay of music and education, particularly focused on the impact of music on motivation and memory. The findings and procedures of these studies were used to inform the design of the current study, which compared the use of songs versus traditional strategies on the effective learning of high-frequency words and motivation for below grade-level kindergarten students.

Sight Words

Recently, much attention regarding effective early elementary literacy programs has been focused on systematic phonics instruction (Armbruster, Lehr, Osborn, & Adler, 2003). However, many words in the English language do not follow standard grammar rules and therefore need to be memorized. Furthermore, memorizing common words – being able to read them by sight and not though decoding – can improve student fluency and comprehension by allowing students to shift their focus to the meaning of text. The following studies provide support for the necessity
of sight word instruction as well as findings about the effectiveness of different presentation styles and teaching methods.

A recent study by Watts and Gardner (2013) called to question the sufficiency of systematic phonics, examining the need for sight word instruction. Their primary research question was whether a synthetic phonics curriculum alone was sufficient for the effective reading development of early elementary students or if intensive training of high frequency words benefitted reading ability. They were also interested in seeing whether either of these approaches was more effective for students at different reading levels. The independent variable was instruction type: synthetic phonics only versus phonics supplemented by high-frequency word training. The main dependent variables were results from the Salford Reading Test (Bookbinder, Vincent, & Crumpler, 2000), including an analysis of miscues. For the Salford Reading Test, students read a series of increasingly more difficult sentences and were asked to stop when they reach six consecutive errors. The researchers also analyzed results from the Sounds/Write Phoneme skills test (Case, Philpot, & Walker, 2006) and from High Frequency Word (HFW) Audits, developed by the researchers. The Sounds/Write Phoneme skill test assessed students’ phonological awareness skills. The High Frequency Words Audits assessed how many of 113 words students could automatically identify.

The participants for this study were eight year-one students in a British school. The students attended a school that exclusively used systematic synthetic phonics to teach reading. Baseline testing using the Salford Reading Test revealed that only three of the eight students were on grade level in reading prior to beginning the study. The other students were on average a year behind in reading. The study used pre-test and post-test data to compare the relative effects of the approaches, so all eight students underwent the intervention.
Before beginning the study, the researchers collected baseline data on students’ reading ability using the Salford Reading Test. A few weeks later, students took the Salford Reading Test again. During the period of time between these two test sessions, students underwent their usual systematic synthetic phonics training. This phase of the study (Stage 1) was used as a control with which to compare results from the high-frequency word intervention. After students completed the second round of testing at the end of Stage 1, the intervention (Stage 2) began. During the intervention, students were exposed to high-frequency words for five minutes each day using a “look and say” method. This instruction on high-frequency words supplemented the traditional systematic phonics curriculum and took place during the typical literacy block. The intervention period lasted for five weeks. Students underwent a HFW Audit before the intervention, two weeks into the intervention, and again at the end of the study. Students also took the Salford Reading Test for the third time and the Sound/Write Phoneme skills test after the five-week intervention period.

After Stage 1 (traditional phonics curriculum), only one of the five students below grade level caught up to grade level in reading according to the second round of the Salford Reading Test. The other four were still significantly behind. After Stage 2 (instruction supplemented with high-frequency word practice), all but one student achieved grade level on the Reading test. The miscue analysis provided further information on students’ reading abilities. Almost all students had less miscues overall following high-frequency word instruction. The researchers analyzed students’ errors in reading and determined that most students actually did not use phonics to figure out unknown words, but more often they relied on semantics. In a few cases where students did use phonics to decode words, the irregularity of the words caused students to misread the words (ex: the word “race” which uses the less common soft c sound was misread as
“rack”). These findings imply that phonics alone is not sufficient for strong reading. Fluency was also greater at the last test, indicative of the benefit automatic recognition of whole words has over slower phonics approaches to decoding words. This improvement in fluency was greater for students considered low readers.

This study supports the need for explicit high-frequency word instruction in addition to a traditional phonics approach. While it cannot be said for certain that students’ growth in reading was due solely to instruction on sight words due to the lack of a true control group, the inclusion of explicit high-frequency word instruction was certainly not detrimental to students’ reading growth. The results of the Salford Reading test indicated that students became better readers after the intervention stage, in which five minutes of daily literacy instruction was focused on high-frequency words. Both fluency and accuracy improved as students grew more familiar with reading common, and sometimes irregular, words. Drilling high-frequency words may be necessary for the reading development of some students, especially when considering that many common words in the English language do not follow typical grammar rules and therefore cannot be decoded using phonics strategies. The results also suggest that supplemental high-frequency word instruction may be especially beneficial for students considered low readers, and may be the key to catching these students up to grade-level reading.

Given that Watts and Gardner’s 2013 study supported the need for high-frequency word instruction in a complete literacy curriculum, it is therefore necessary to determine effective approaches for teaching these words. Two common approaches – flashcard drills and mnemonic devices – are described in this section. A review of the literature shows benefits and limitations associated with these methods.
Teachers use several different flashcard strategies to present new words to students. In 2008, researchers Nist and Joseph compared three of these different instructional methods: traditional drill and practice (TD), in which only unknown words are presented; interspersal training (IST), in which known words are combined with unknown words; and incremental rehearsal (IR), in which an unknown word is practiced amongst known words until it becomes a known word. The purpose of the study was to discover not only which of the three methods was the most effective, but also which was the most efficient. Effectiveness referred to the number of words learned, whereas efficiency referred to the rate of word learning (number of words learned divided by the amount of time spent learning). Additionally, the researchers sought to determine whether the strategy that was most effective for short-term learning was also the most effective for maintaining words in memory or generalizing learning to reading in context. The independent variable was instructional method: TD versus IST versus IR. The dependent variables were next day retention probes, a maintenance probe (given a week after the intervention), and a generalization probe (also given a week after the intervention). The retention probes and the maintenance probe consisted of students reading target words presented on flashcards; the generalization probe consisted of students reading target words in sentences.

The intervention took place in an urban elementary school. Six first-grade students, who were identified as having word reading difficulties by their teacher, participated in this study. The participants were all Caucasian and qualified for free or reduced-price lunch. None of the students had an IEP or received special education services. Instead of randomly assigning students to one of the conditions, all students received instruction in all three methods during their intervention sessions. Prior to beginning the intervention, students were tested on a list of 200 words from classroom books and high frequency word lists. Words that students read
correctly on both trials of this test were considered known words; words that students did not read correctly on either of the trials were considered unknown words. Unknown words were randomly assigned to one of the three conditions and the known words were randomly assigned to either the IST or the IR condition. As different unknown words were used for each of the conditions, the researchers could determine which method was the most effective or efficient by examining which words students learned.

The intervention took place three days a week for four weeks. Students learned new words in the first and second sessions each week and completed next-day retention probes on the second and third day (therefore, no word learning occurred on the third day). Each session consisted of TD, IST, and IR practice, and the order in which these methods were used during a session alternated. Students learned six unknown words using each method per session; therefore, students learned eighteen words each day. Words that students did not get correct on next-day retention probes were added back to the collection of unknown words and taught again using the same method as before. The procedure in which the psychologist presented the words to the students was similar across conditions. When introducing the new words, the psychologist would present a word on a flashcard to the student and model how to correctly pronounce it; then students would repeat. After the six words were introduced, the participants completed eight more trials of flashcard drills. In these trials, the psychologist would not model each word but did verbally praise the student the first time each word was read correctly and provided feedback after students read words incorrectly. The trials for the TD condition consisted of just the six target unknown words. The trials for the IST condition consisted of nine words: the six target unknown words, with three known words interspersed. The trials for the IR condition were more complicated – each of the six target unknown words was presented incrementally among nine
known words using the following pattern: U1, K1, U1, K1, K2, U1, K1, K2, K3, U1, K1, K2, K3, K4, U1, K1, K2, K3, K4, K5, U1, K1, K2, K3, K4, K5, K6, U1, K1, K2, K3, K4, K5, K6, K7, U1, K1, K2, K3, K4, K5, K6, K7, K8, U1, K1, K2, K3, K4, K5, K6, K7, K8, K9, U2 ...(U1 stands for the first unknown word, K1 is the first known word, K2 is the second known word, etc.). The IR condition also used a “folding-in” method; whereby after all nine trials of an unknown word were completed, it would become one of the known words.

Using the cumulative number of words known on the retention probes, the researchers determined IR to be the most effective strategy - five of the six students learned more of the words presented in this condition than words in other conditions. However, when analyzing the rate of words learned, TD was the most effective – all of the students learned more words per minute in the TD condition. When examining the maintenance and generalization data, the researchers found that IR was once again the most effective strategy – students remembered the highest percentage of words from this condition. However, the number of words learned in each condition did not differ by a large amount. After the intervention was completed, the researchers also asked the teachers and students for their thoughts on the three different conditions. Both the teachers and students indicated that all three methods were effective and that all were useful for learning new words. All six of the students also noted that the TD condition was their favorite, because it took the least amount of time to implement. This preference contradicts previous studies which indicated that students preferred methods that included known words because these required less effort than methods involving all unknown words.

This study presents a number of implications for teaching students new words using flashcard methods. First of all, IR seems to be the best strategy for teaching new words. A major reason for the effectiveness of this strategy may be the “folding-in” aspect of it – because
unknown words became known words, students had more opportunities to practice the known words. However, considering that students still learned a large percentage of the words in the TD condition and it took much less time to implement, teachers may prefer to use the TD method when time is a factor. Teachers may also consider using the TD method due to student preferences. As this condition takes the least amount of time, students may be more likely to maintain active engagement throughout the intervention. The authors suggest that TD could be an efficient way to conduct interventions for most students, whereas more intensive IR practices could be reserved for situations in which students have cognitive disabilities or are not learning using traditional methods.

In 2011, Volpe, Mule, Briesch, Joseph, and Burns extended the work of Nist and Joseph (2008) by examining the effectiveness and efficiency of two of the flashcard methods, but using two different conditions. The methods used were traditional drill and practice (TD) and incremental release (IR). The researchers examined whether holding the opportunities to respond constant versus holding the amount of time spent on the intervention constant would impact which of the methods was more effective or more efficient. Like the Nist and Joseph study, this study also tested to see whether there were differences in effectiveness and efficiency in short-term and long-term memory tests, as well as on a test of generalization. The independent variables were method: TD versus IR and condition: opportunities to respond held constant versus time held constant. The dependent variables were next day retention probes, a maintenance probe given one week after the intervention, and a generalization sentence reading test given one week after the intervention.

The study was conducted in a public urban school in the Northeastern United States where approximately 71% of students qualified for free or reduced price lunch. Four African-
American first-grade students were referred by the teacher to participate in the study due to their word reading difficulties. None of the students had IEPs or were in special education. Similar to the Nist and Joseph 2008 study, students were not sorted into conditions, but rather, all students participated in all four conditions: TD with time held constant (TC), IR with time held constant, TD with opportunities to respond held constant (ORC), and IR with opportunities to respond held constant.

The procedure for this study was comparable to the Nist and Joseph study, with a few variations. Like the 2008 study, students participated in three sessions per week (two days of interventions, with just testing on the third day) for four weeks. All four conditions were presented each day, with the order counterbalanced across sessions. However, in this study, students learned only three unknown words in each condition, for a total of twelve new words each day. The TD condition followed standard procedures – the researcher modeled the words and then students were presented the words without modeling but with corrective feedback. The IR condition followed the same incremental presentation of unknown words amongst five known words, however with one major change – there was no “folding-in” of taught words. The researchers did not use folding-in because they wanted students to have the same number of exposures to the target words in both IR and TD conditions. For the opportunities to respond held constant conditions, the researcher went through five trials (students saw each word five times), regardless of the time it took. For the time held constant condition, the researcher continued to run through the cycle of words until three minutes had passed (at that point the intervention ended, even if they had not made it through five trials).

According to the retention probe data, no one condition emerged as most effective. While students retained more words in the TD-ORC condition than the IR-ORC condition and
remembered slightly more words in the IR-TC condition than the TD-TC condition, neither of these differences were significant. In terms of efficiency, the TD condition was more efficient than the IR condition when opportunities to respond were held constant. The IR-ORC condition took significantly longer, so students learned more words per minute in the TD-ORC condition. However, when time was held constant, the number of words learned in each condition was comparable. Similarly, no significant differences were found between TD and IRC conditions on the maintenance and generalization probes. Efficiency was higher for TD-ORC than for IR-ORC and comparable for both time held constant conditions. Additionally, students completed a survey after the intervention indicating their thoughts about the different conditions. All students felt that they learned many words; however, half preferred the TD method and the other half preferred the IR method.

This study furthered understanding about the efficiency and effectiveness of the TD and IR methods for learning new words. Unlike in previous studies, this study showed that both methods were equally effective for learning new words. This finding suggests that the folding-in of the IR method in the Nist and Joseph 2008 study greatly contributed to the effectiveness of this method. Students benefited from having more exposure to a target word as it turned into a “known” word. Another new finding was that the TD method was only more efficient when opportunities to respond were held constant; therefore, IR could be an efficient method as long as time is held constant. These findings, along with students’ split preferences, suggest that these methods would be equally beneficial in the classroom. Therefore, no flashcard strategy has been found to be the best for presenting new words. The researchers also concluded with a warning that targeting too many words per session may have limited the effectiveness of this study. Therefore, future researchers may want to target fewer words.
While flashcard strategies are common, teachers have also used other methods to teach high-frequency words. Howard, DeDeppo, and De La Paz (2008) investigated to see whether the use of a mnemonic strategy would help students with learning disabilities learn how to spell difficult sight words. They were particularly interested in the use of a strategy they called “PESTS” which used stories and pictures based on acrostics to help students memorize the spelling of difficult words that “bug” them. The study explored whether the mnemonic approach would help students make gains in spelling and whether the gains made would be significantly greater than gains made through the use of a traditional spelling instructional strategy. The independent variable was teaching strategy: experimental (PESTS) versus control (“look, cover, write, check” method). The dependent variables were the Test of Written Spelling (Larsen, Hammill, & Moats, 1976-1999), the Words Their Way Spelling Assessment (Bear, Ivernizzi, Templeton, & Johnston, 2004), and a spelling assessment developed by the researchers.

The participants in this study were three students with learning disabilities from a suburban school serving students of low- to middle- socioeconomic backgrounds. These students were already receiving pull-out literacy instruction from a specialist. The three students included a third-grade boy, a fourth-grade girl, and a fifth-grade boy.

Prior to beginning the intervention, the researchers developed fifteen word lists of comparable difficulty with five words each. All of the word lists contained one second-grade, one third-grade, one fourth-grade, one fifth-grade sight word, and one additional word. The researchers tested the students prior to the study to ensure that students did not already know any of the words on the lists. The control intervention, conducted during baseline, was a traditional method referred to as the “look, cover, write, check” method. In this method, students looked at a word, then covered it and tried to write from memory. They would then check their work and
try to write the word again if they spelled it incorrectly the first time. In the experimental condition, students were taught mnemonics for memorizing the target words. Students were presented with a worksheet containing an acrostic and a picture as the instructor told them the accompanying story. Students then practiced writing the word in a variety of ways as they recited the story. On the first day with the word list, students spent around 30-45 minutes learning the mnemonic and completing the worksheet for all five words on the list. On the second day, students completed a word search in which they looked for the correctly spelled versions of the five target words.

During the comparison condition, students did not make any gains on the spelling of sight words compared to pre-test scores. Following the experimental condition, students made gains of 1.5 to 2.5 words out of five on the weekly tests of the word lists. When tested on twelve of the experimental words two months after the intervention, students performed well, correctly spelling an average of nine words. After the experimental intervention, students also made significant gains on both the Test of Written Spelling and Words Their Way elementary spelling assessments, improving to the low-average to average range.

The study demonstrated that the PESTS method was effective in helping students develop their spelling skills. Beyond helping students learn how to write the difficult words of the study, students were also able to generalize the strategy to help them in other writing domains. The study showed that using teaching techniques that incorporate more student engagement and that can facilitate the development of long-term memory can help students learn and remember how to spell difficult sight words. The findings encourage the use of non-traditional methods to help students memorize correct spellings of words.
In addition to finding effective strategies for teaching the reading or writing of high-frequency words, researchers have also studied the beneficial relationship between being able to read and being able to spell common sight words. Given that this intervention involved both reading and spelling high-frequency words, it is important to understand how these two skills are interrelated. In their study, Noell, Connell, and Duhon (2006) investigated generalization as it relates to high-frequency words. While the link between reading and writing is commonly studied for phonetically spelled words, less is known about generalization for irregular words, which need to be taught using a whole-word approach. Through their experiment, the researchers tried to answer the question of whether just learning to read or just learning to write an irregularly spelled unknown word would enable students to transfer their knowledge to the other skill. For example, if a student was only explicitly taught how to read a word, would they be able to learn how to spell the word on their own? The researchers also wondered whether acquisition and generalization rates would be higher for one learning stimulus than the other. The independent variables were teaching method: reading versus spelling and session type: acquisition versus generalization. The dependent variable was the percentage of words read or spelled correctly.

The participants for this study included three African American first-grade students from the same school. These students did not have any developmental disabilities and were not in special education; however, they were referred by the teacher for having below average reading and writing abilities. Prior to the intervention, students were pre-tested on their ability to read common words. Thirty words that were unknown by all three students were chosen to be the target words for the intervention. Ten of these words were taught through reading only, ten were taught through spelling only, and ten were control words.
Each day students participated in an intervention block that consisted of four session types: reading acquisition, spelling acquisition, reading generalization, and spelling generalization. Students were also tested on control words. Both acquisition sessions were presented before the generalization sessions. For reading acquisition sessions, students were shown a flashcard with a word. If the student said the correct word, the experimenter praised the student. If the student did not respond with the word within three seconds, the experimenter would prompt the student by saying the word and having the student repeat. Students completed five trials of each word per session. The spelling acquisition sessions consisted of an experimenter saying a word and the participant spelling the word aloud (the word was never shown to the student). If the student did not spell the word correctly, the experimenter would provide the correct spelling. The spelling acquisition sessions were timed to last as long as the reading acquisition sessions; therefore, students did not necessarily reach five trials per word per session. In reading to spelling generalizations, students were told a word from the reading acquisition list and asked to spell it aloud. In spelling to reading generalization, students were shown a flashcard of a word from the spelling acquisition list and asked to read what it said within three seconds. No feedback or prompts were given in either generalization session.

Participants received the intervention independently and each students’ amount of participation was dependent on their attendance. While two of the students completed over eighty sessions, the other student, who had more absences, completed sixty sessions.

Students’ responses were analyzed for rate of acquisition and ability to generalize words. Rate of acquisition did not yield a consistent result; however, it did slightly preference reading acquisition. While students initially acquired words in the reading condition faster than words in the spelling condition, this trend did not remain constant, and even in earlier trials, differences in
learning rates were modest. However, the overall slight preference towards reading acquisition makes sense because it is an easier task and students were able to complete more trials per word, thus enabling them to learn words in this condition more quickly. Students learned effectively in both conditions: most of the students approached mastery on both reading and spelling by the end of the trial, with the exception of the student who attended sixty sessions, who only reached around 80% accuracy on spelling acquisition trials. In terms of generalization, two of the students exhibited higher rates of generalization from spelling to reading, and one student had higher generalization from reading to spelling. The percentage of words successfully generalized ranged between 60-87% across all students and conditions.

Overall, this experiment showed that generalization does occur for irregularly spelled words learned through a whole-word approach. Students were able to spell words they were only taught to read and read words they were only taught to spell for well over half of the target unknown words. These findings suggest that knowing how to read a word can help a person to spell a word and knowing how to spell a word can help a person to read it. However, the rates of acquisition and generalization varied from student to student indicating that there are individual differences and that no presentation type was more efficient. Therefore, no one teaching method is necessarily sufficient for all students. The results also showed that generalization was incomplete. No student was able to reach mastery for any of the generalization trials. Therefore, although generalization can help students to transfer skills, some explicit teaching is necessary for complete mastery of both skills.

The ability of the students to generalize their knowledge to read or spell words without being explicitly taught indicates that there is a relationship between reading and writing, even for irregularly spelled words. Rosenthal and Ehri (2008) examined another aspect of this
relationship. The authors noted that displaying words is not a commonly researched or suggested aspect of vocabulary teaching; however, they hypothesized that seeing the spelling of a word would be beneficial due to the contributions of orthographic mapping on word learning. Their primary research question was whether elementary school students would remember words’ pronunciations and meanings better if the word was displayed during teaching. The researchers also investigated whether the reading level and age of students impacted findings. Therefore, they conducted two similar experiments – the first with second-graders and the second with fifth-graders. As the target population of the current study was kindergarteners, only the experiment with second-graders will be summarized, as it is more relevant. However, it should be noted that the researchers found similar results in both of their studies. The independent variable for the experiment was presentation type: written word present versus written word absent. The dependent variables were the number of trials necessary for students to master the words, as well as performance on three tests: one in which students had to provide the word after hearing a definition, one in which students had to write a spoken word, and the last in which students had to choose the correct word to fill in a sentence.

Twenty second-graders from a school in a mid-sized city participated in this intervention. Of the twenty students, fifteen were African American and five were Latin American. None of the students were receiving special education or English language services. Prior to the intervention, students were tested on their word reading using the Woodcock Reading Mastery Test-Revised (WRMT-R; Woodcock, 1987), their ability to read and spell nonsense words using words constructed by the researchers, and their vocabulary using the Peabody Picture Vocabulary Test (PPVT-III; Dunn & Dunn, 1997). On average, students scored on grade level for reading abilities, but below average on vocabulary measures.
Two sets of six concrete but rare words were used as the target words for the study. Students were not familiar with any of the words prior to the study. Words were presented on cards – one set of words was taught with both a picture of the word and the written word on the card (written word present condition); the other set was presented with just a picture of the word (written word absent condition). When the words were introduced, the researcher would present the picture card, say the word aloud, and then define the word in a sentence; students were to repeat the word and sentence. Even in the word present condition, no attention or instruction was given to the spelling of the word. After the study trial, students reviewed through both a pronunciation recall trial and a meaning recall trial. In pronunciation trials, students were shown only the picture and had to say the word; in meaning trials, students were told a word and had to provide a definition. Feedback was given on all trials. Students completed between six and nine trials – students had to complete at least six trials, but once they reached six and had three accurate trials in a row, they could stop (they reached criterion). The experiment took place over three days. On the first day, students would learn their first set of words in one of the conditions. On the second day, they would be tested on Day 1 words and then learned the second set of words in the other condition. On the third day, students were tested on Day 2 words. The order of the conditions and word sets were counterbalanced across the participants.

Results from the study showed that learning of both pronunciation and meaning was higher in the written words present condition. More students reached criterion faster in the words present condition than in the words absent condition. Additionally, the researchers found that the benefit of the words present condition was greater for learning pronunciation than learning meaning. According to the post-tests, students remembered the pronunciation of words in the word present condition better than the words from the word absent condition. Students
also did better on spelling words from the word present condition. The results of the fill in the blank test were not significant due to ceiling effects.

The results from this study showed that both second graders and fifth graders benefitted from exposure to the written form of a word during vocabulary learning. The findings suggest that readers at all levels can benefit from the additional support of orthography when learning words. Furthermore, seeing the written form of the word aids not only pronunciation, but also the learning of meaning. The researchers noted that none of the students engaged in active decoding of the words presented on the card nor did the instructor ever point students’ attention to the written form of the word. However, students must have automatically engaged in orthographic mapping, building a stronger representation of the word in their memory by subconsciously connecting graphemes to phonemes. This study has important implications for the teaching of vocabulary. When learning new words, students should see the word in addition to saying it and discussing its meaning. The connection of these different word attributes can help students build a stronger representation and knowledge of the word in their memory and can help them learn the word more quickly.

A review of the literature on sight word instruction provided information on strategies that could be used to teach words, as well as justified the need for explicit training of irregular words (Watts & Gardner, 2013). Additionally, several studies indicated that a strong relationship existed between reading and spelling high-frequency words (Rosenthal & Ehri, 2008; Noell et al., 2006), which supported the dual aim of this study: to increase word reading and writing skills. Nist and Joseph’s (2008) study and Volpe et al. (2011) study comparing flashcard methods showed that traditional drills were both effective and efficient, supporting the use of a traditional drill as the teaching method for the control group. However, because the students in
my study were not successful at learning the target words the first time they were presented, another memorization method - in this case music - may be necessary for reaching these students and maintaining their attention, similar to the use of the PESTS strategy in the Howard et al. (2008) study. The following section explores ways in which researchers have found music to positively impact classroom learning and memorization, validating its use as the experimental strategy.

Music and Education

Educators have long used music as a means to engage students and teach new material. One reason why teachers use music is because it is fun; songs can help improve students’ moods and encourage participation. Additionally, some researchers have found that music not only promotes socioemotional development of students, but also their academic growth.

Music can help motivate students. By capturing students’ interests, music can help students become more involved in activities and learn more from instruction. In one study, Fisher (2001) examined the relationship between music and language development in early childhood classrooms, particularly focusing on bilingual students. The primary research question was whether the use of music would result in increased language performance for bilingual students. Furthermore, Fisher sought to analyze how music was being used in classrooms and whether the way music was used had any impact on student results. The independent variable was instruction type: music integrated classroom or no music. The dependent variable was achievement on literacy tests including the Student Oral Language Observation Matrix (SOLOM; California State Department of Education, 1981), the Yopp-
Singer Test of Phoneme Segmentation (Yopp, 1995), and the Developmental Reading Assessment (DRA; Beaver, 1997). Classroom observations were also done twice per month.

The study was conducted in one urban school with an extensive bilingual program. Four bilingual kindergarten classrooms were used for the study and divided into two experimental and two control classrooms. Eighty kindergarteners were randomly assigned to one of the four classrooms and were with the same classroom teacher for both kindergarten and first grade. All of these students spoke Spanish at home and qualified for free or reduced price lunch. The study took place over two years, and at the time of the post-test, seventy-one students remained in the study.

The four classroom teachers were consistent with the type of instruction they used in their three-hour literacy block (Read Aloud, Guided Reading, Word Work, Writing, and Independent Reading). The teachers also used many of the same books and printed materials in their literacy lessons and planned together weekly to align their thematic units and lessons. However, the teachers in the experimental classrooms also incorporated music at three key moments throughout the day – as an opening, during word work, and during independent reading – whereas the control classroom teachers did not use music. At the beginning of the day, experimental classrooms started with a song (usually related to pride or self-esteem), whereas control classrooms talked about the calendar and weather. For word work, experimental classrooms used a word from a song title and then played that song, while control classrooms used words from a commercial word list. Finally, for the listening center, students in the experimental classrooms had the option of listening to books on tape that included supplemental CDs, whereas students in the control classrooms only listened to books without music.
Prior to the study, students in the four classrooms had no significant differences on any of the literacy measures (SOLOM, Yopp-Singer, and DRA). After the intervention, students in the music classroom scored significantly better than the students in the no music classrooms on the SOLOM and Yopp-Singer tests. The researcher also found that ten students from experimental classrooms were reading on grade level in English according to the DRA compared to only one student from the control classrooms who was reading on grade level.

The results of the study suggest that playing music in the classroom may be beneficial to students’ language development. The teachers in this study integrated music in three specific ways, although there may be other opportunities for using music. According to notes from classroom observation, music seemed to motivate students (as in the word work activities in which students excitedly tried to figure out the mystery word) and contribute to positive self image (as in the morning opening during which students were excited to pick “feel-good” songs to sing). Additionally, the music-integrated classrooms had a more positive working atmosphere, in which students were very engaged in tasks and exhibited a desire to learn. However, these factors were not tested for, so it cannot be said whether music had a significant effect on student attitudes and motivation. More research must be done to determine the mechanism responsible for student gains.

Another study looked more directly at how instruction involving music can boost student engagement thus leading to gains in literacy. In this study, Cole and Hilliard (2006) were interested in analyzing the effects of the web-based Reading Upgrade curriculum (Learning Upgrade, 2000), which features videos and songs, on struggling students’ reading performance and motivation. The researchers were particularly interested in using this web-based reading program because they felt it was more culturally responsive than many traditional interventions.
For example, this program included the use of popular/hip hop songs, characters with different skin colors, and phrases in English and Spanish. The researchers were primarily investigating whether the use of *Reading Upgrade* would lead to higher gains in students’ literacy skills (decoding, fluency, phonics, phonemic awareness) than a traditional intervention. They were also interested in analyzing whether the culturally responsive nature of the intervention impacted student reading motivation. The independent variable was instruction type: *Reading Upgrade* web program versus traditional intervention. The dependent variables for reading measures were scores on the Developmental Reading Assessment (DRA; Beaver, 1997) and the Wide Range Achievement Test (WRAT-3; Wilkinson, 1993). The DRA measures reading accuracy, fluency, and comprehension; the WRAT-3 measures students’ ability to name letters and pronounce words out of context. The dependent variables for motivation measures were responses to a 12-item reading motivation questionnaire and coding of two research assistants’ observations.

The study took place in a public urban elementary school in California. The school has a racially and ethnically diverse population of 656 students, 97% of whom qualify for free or reduced price lunch. The participants for the study were drawn from the third-grade because this grade had the largest number of students enrolled in the school’s enrichment program. Forty-four of the 62 third graders who were considered to be “struggling readers” (performing two or more grade levels behind) returned their permission slips and started the study; 36 of these 44 students completed the study (as some students moved away during the intervention). These 36 students ranged in age from eight to ten-years-old and included twenty-one African American, ten Latino, two white, and one Asian student. Seventeen girls and nineteen boys completed the intervention.
Once permission slips were received, all students underwent pre-testing, which included the DRA the WRAT-3. The students were then randomly assigned to the control or experimental condition. In the experimental condition, students spent ninety minutes before school twice a week working on Reading Upgrade lessons. Lessons began with instructional songs and videos and ended with a practice activity or game. Students started with lessons on basic phonics and phonemic awareness skills and worked their way up to higher levels, covering word decoding, multi-syllable words, and reading comprehension. The control group met with a reading specialist for an hour before school three times a week. The specialist used the Direct Reading Instruction model, which consists of teacher modeling, student choral response, and teacher feedback. Both groups received 180 minutes per week of intervention time for eight weeks. After eight weeks, all students then took the DRA and WRAT-3 again and completed the motivation questionnaire.

Cole and Hilliard found that, according to the post-test results, students in the experimental group scored significantly higher than students in the control group on both the DRA and the WRAT-3. The gain these students made was equivalent to an improvement of one whole grade level. The motivation questionnaire showed that lower readers had more book avoidance and required more extrinsic motivation. The observation notes showed that participants in the experimental group exhibited increasing eagerness to use the program and that most students were actively engaged throughout the intervention. Students in the experimental group also had an increase in cooperative behavior as well as peer-to-peer competition. Finally, the observers noticed an interaction between the cultural background of the students and how they responded to the program. They noted that African American students especially seemed to respond positively to the music aspect of the program.
Cole and Hilliard’s study showed a positive impact of the *Reading Upgrade* program on struggling students’ literacy skills; however, the exact mechanism for this change was unclear. Observation notes indicated that students were highly motivated to participate in the study as they grew in confidence and familiarity; so high levels of motivation and engagement may have led to the gains in literacy skills. A major factor in students’ motivation to develop literacy skills through this program was the inclusion of music. In addition to the engaging aspect of the music, the songs also included word repetition, which is an essential component to struggling readers’ acquisition of new words, but is often neglected in traditional reading curricula. In general, the heavy use of music in this study and its noted significance in developing a culturally responsive intervention (particularly for African American students) suggests that the inclusion of songs is an important factor to consider when designing reading interventions.

While the above studies noted the positive impact of music on literacy gains in general, other studies have looked specifically at the use of music to help students learn new words. Ludke, Ferreira, and Overy (2014) examined the impact of music in acquiring phrases in a foreign language. The main research question was whether the way Hungarian phrases were presented (through regular speaking, rhythmic speaking, or singing) impacted participants’ recall and application of the phrases. The researchers also used a variety of test types to see if memory was aided more for particular types of tasks over others. The independent variable was training style: speaking, rhythmic speaking, or singing. The dependent variables were scores on five tests of Hungarian language learning: a multiple-choice Hungarian vocabulary test (in which participants had to choose the correct English translation from four options), a Hungarian production task (in which participants spoke the Hungarian phrase that corresponded to the English prompt), an English recall task (in which participants heard a Hungarian phrase and
provided the English translation), a Hungarian recognition test (in which participants determined whether a phrase spoken in Hungarian was said correctly), and a delayed Hungarian conversation task (in which participants tried to respond appropriately to Hungarian phrases in Hungarian).

The participants consisted of 60 adults (30 men and 30 women) ranging from 18-29 years old who were recruited from a university website. Ten males and ten females were randomly assigned to one of the three conditions. As part of the study, participants completed tests and surveys analyzing working memory ability, mood, and language and music experience to account for any extraneous variables. There were no significant differences on any of these measures across participants in the three conditions. Before training, participants also completed the multiple-choice Hungarian vocabulary test to determine if they had any prior familiarity with the language. Four participants who scored over a fifty percent on this test were excluded from the study, as it was determined that they might have some background experience with the language.

Participants completed the experiment in individual sessions and each session took approximately an hour to complete. Participants first took the Hungarian vocabulary pre-test and working memory test and then began their training. Training was fifteen minutes total, consisting of three five-minute “listen-and-repeat” sessions in which participants learned twenty Hungarian phrases either through a normal speaking audio recording, a rhythmic speaking recording, or a singing recording. In the speaking condition, a person said the phrase in a normal speaking voice; in the rhythmic speaking condition, the speaker spoke in time with a metronomic pulse; and in the singing condition, the speaker used the same rhythm as the rhythmic speaking condition but also had the additional layer of a melody. The training used the same procedure and timing in each of the conditions. A phrase was first said in English, then there was a one
second pause before the phrase was said or sung twice in Hungarian. Participants were to repeat
the phrase, matching the presentation in the recording (speaking, rhythmic speaking, or singing).
This procedure continued until all twenty phrases were presented. In the first five-minute
session, phrases were presented orally and visually; in the remaining two sessions, phrases were
presented orally only. Following training, participants completed the first four dependent
measures (Hungarian vocabulary test, English recall, Hungarian production, and Hungarian
recognition). They then completed the background surveys (mood and musical and language
experience questionnaires) to allow time to pass before completing the time-delay Hungarian
conversation task.

For four of the five tests (Hungarian production, English recall, Hungarian vocabulary,
and Hungarian conversation), the mean score for the singing condition was higher than the mean
scores for either of the other conditions. For the Hungarian recognition test, the mean score (16)
was the same for both the singing and speaking conditions, which was higher than the mean for
the rhythmic speaking condition (15). In terms of statistical significance, a MANOVA showed
that there was a main effect of condition on tasks that involved producing Hungarian phrases (the
Hungarian production and the Hungarian conversation tests), with the singing condition having
the highest performance; however, there was no main effect for the other three tests. The results
indicated that there is a beneficial effect of singing on language learning, even when controlling
for the duration of a stimulus, particularly for tasks that involve verbatim reproduction of
phrases. The study also indicated that the use of melody is more effective than rhythm alone in
memorization. One potential explanation for the success in the singing condition is that pitch
information provided an additional cue to help in memory retrieval and recall; other researchers
have suggested that the integration of lyrics and melody aid in input processing.
Ludke et al. (2014) found that music was beneficial for adult word-learning; however, similar results have also been found in studies involving young children. Of more relevance to the current study, Walton (2014) examined kindergarten classrooms to see if the integration of music would help students score better on measures of letter-sound correspondence, phoneme identification, rhyme production, and word reading. Additionally, he was interested in analyzing the strategies students used to decode words on the post-test word reading measure. Students might just memorize words used in the songs (and struggle with novel words), students might use known rhyming words to decode by analogy, or students might use individual phonemes and then blend to form the whole word. For this study, the independent variable was instruction type: music-integrated versus traditional. The dependent variables were pre and post-test scores on the four literacy tests: a rhyme generation task, the Vopp Sound Isolation Test, a letter-sound knowledge test (in which students produced the sound for each letter), and a word reading test (in which students read from a list of twelve words, with eight words from the songs and four novel words).

Six different kindergarten classrooms from four Canadian schools were used as participants in this study. Final data from the study included ninety-three kindergarten students from varying socioeconomic backgrounds. As it would be too disruptive to take students out of the classroom to administer the music intervention, classrooms, not students, were randomly assigned to the conditions. According to the pre-test scores, there were no significant differences between the classrooms prior to the intervention.

Prior to the study Walton worked with a team of musicians to develop eighteen original songs using basic, kindergarten-friendly words and rhymes. They piloted this music with a group of kindergarteners and chose twelve of the original eighteen songs to include in the study.
based on how the students reacted to the songs. They wanted to use songs that the students enjoyed and could learn quickly. In addition to the music, the research team also developed motions (mostly signs from American Sign Language) to go along with ten of the twelve songs. A research assistant led the interventions in the music-integrated classrooms. The research assistant would introduce the music and have the students learn the motions and words, then they would display the lyrics as the students sang along, and finally they had the students practice without the music, just using the text. The researchers also led students in activities related to the songs, such as sounding out selected words from the songs or emphasizing rhymes. This intervention took place twice a week for twenty minutes for twelve weeks. The researchers did not oversee literacy instruction in the control classrooms; however, they did note that an equal amount of time was spent on literacy in all six classrooms.

On the post-test, no significant differences were found between the control and experimental classrooms on measures of rhyming, initial, and final phoneme identification. Students in the music condition scored significantly higher than the control group on the letter-knowledge test, medial phoneme identification, and the word reading test (for both words from the songs and novel words). Walton also found that achievement on beginning and medial phoneme identification and letter-sound knowledge were the strongest predictors for success in word reading. This finding suggests that students were decoding words sound-by-sound and not using a decode-by-analogy strategy (as strong performance on rhyming might suggest) or memorization.

The results indicated that music and movement may be effective for developing kindergarteners’ skills in identification of medial phonemes and letter sounds. Furthermore, the experimental condition had a positive effect on students’ development of reading skills. Walton
discussed two mechanisms through which these gains may have been possible. First, Walton noted that the music and movement may have facilitated the development of the students’ long-term memory. The songs also contained blending and segmentation of words within the lyrics, so exposure to these skills may have enhanced students’ ability to apply them to decode words. While Walton noted that further research must be done to understand the mechanism by which music helps develop reading skills, the results indicated that music may be effective in developing students’ long-term memory with regard to literacy and in helping students attend to sounds and the blending of words.

A number of researchers have also specifically studied the use of music as a tool for memorization, not just learning, of words. These studies have implications for the current study because the experimental condition relied on the ability of students to memorize short songs about the target words and not just learn words out of context. The following studies were removed from the classroom and used standard experimental procedures. While these studies were not conducted in a classroom, they can still provide information on the benefits and limitations of using music and implications for how music interventions should be incorporated into curricula. Furthermore, laboratory experiments can investigate aspects of interventions that can be harder to test in the classroom.

In one memory study, Calvert and Tart (1993) were interested in seeing the impact of using music in both short and long-term verbatim recall tasks. The study was inspired by a School House Rock television segment that put the words of the Preamble to the Constitution to music. The researchers wondered whether children who were exposed to this song version of the Preamble, as opposed to those who just learned it as prose in school, would be more likely to remember the words later in life due to the representational structure provided by the song. In
order to supplement this naturalistic study, the researchers also conducted an experimental study testing whether students had better verbatim recall of words for texts presented in a song form versus a verbal form. Therefore, the central question for both studies was whether setting words to music would help students recall the words better than just hearing the words spoken. The researchers were also interested in seeing whether the amount of exposure to a text (spoken or in song) impacted memory trends. Finally, the study investigated whether people who hear words to music are more likely to involuntarily rehearse the text than people who just hear the words spoken, as songs are known to get “stuck” in people’s heads.

The independent variable for both studies was presentation type: song versus spoken. The second study (the experimental study) also had a second independent variable of amount of repetition: single versus repeated exposure. The dependent variable for Study 1 (the naturalistic study) was a very long-term verbatim recall test, in which participants were asked to write as many words as they knew to the Preamble to the Constitution. The dependent variables for Study 2 were a short-term recall test (done during the testing session), a long-term recall test (completed five weeks after the session), and a survey asking about participants’ rehearsal activities.

Participants for Study 1 included sixteen university students; eight men and eight women. Participants for Study 2 consisted of 28 university students; sixteen women and twelve men. Prior to completing the study, participants were screened to ensure that they had little to no exposure to School House Rock and that all were of American nationality. These 28 students were randomly assigned to one of four conditions: song with repetition, verbal with repetition, song without repetition, and verbal without repetition.
The procedure for Study 1 was simple. As the researchers wanted to test very long-term recall, the study did not involve any training prior to having participants complete the dependent variable measure (in which they were asked to write as much of the Preamble to the Constitution that they could remember). After writing the Preamble, participants completed a series of questions asking them about their retrieval strategies, how frequently they viewed School House Rock as a child, whether they used the song to help them in school, how long since they had heard it, and whether they thought singing was an effective retrieval strategy.

The results for Study 1 showed that participants who used singing as a retrieval strategy had seen the School House Rock vignette more in their childhood than participants who did not use a singing strategy. Furthermore, participants who used the singing strategy remembered significantly more of the words than participants who said the words, suggesting very long-term memory for the text as presented through song. Finally, the majority of participants in both groups expressed that singing is an effective memory strategy.

While Study 1 indicated that there might be a benefit of using song to remember a text, the non-experimental nature of the study meant that there were potentially extraneous variables. Therefore, Study 2 was used to control for the amount of prior exposure to the School House Rock song by using participants who had never heard it before. Participants were divided into four groups based on whether they would be trained on the text using the song or spoken version and on how many times they would hear the text prior to testing. The song version was the School House Rock song; the spoken version was created by having someone speak exactly the same words with the same timing as the song without using melody or music. Participants in the no repetition groups heard the text only once. Participants in the repetition groups heard the text twice a week for four weeks (eight times total). Immediately following training and again five
weeks later, participants were asked to write down as many words to the Preamble to the Constitution as they could remember. Students were also asked to complete a questionnaire about their rehearsal activities. The researchers asked how frequently participants practiced the text either out loud or in their head and whether they practiced by singing or saying the words.

The results of Study 2 revealed that students who were exposed to the song version remembered significantly more of the words than participants in the spoken condition, but only if they heard the song more than once. Participants in the no repetition conditions scored similarly regardless of presentation type. These results were even stronger for the long-term recall task. The rehearsal activities questionnaire showed that participants in the repeated song condition reported more rehearsal than other students. The results also indicated that participants rehearsed in their head significantly more than they rehearsed aloud.

This study showed that in both naturalistic and experimental settings music can be used to help people recall words from text. These results indicated that music is an important mnemonic device; however, only when used through repeated exposure. Hearing the song once was not sufficient for developing memory strategies. The researchers offered some explanations for why music is a powerful memory tool. First, music provides an additional cue for encoding, as words may be chunked using rhythm or rhyme in addition to meaning. Secondly, the structural pattern of music can provide a cue during retrieval. Therefore, people who practice a text through song can more easily figure out where they are missing words during recall. Finally, music is more likely to be rehearsed involuntarily. People may get a song in their head and unknowingly rehearse the text, building their memory for it. This last point is especially important when considering mnemonic strategies for young students, as songs are memorable for young children whereas other recall strategies (for example, acronyms) are not yet developed.
Another researcher, Wallace (1994), also examined the properties of songs that make them effective tools for memorization. Primarily, he investigated whether songs were memorable due to the rhythm and rhyme of the words alone or if melody had an effect. The second research question sought to identify instances in which music was more memorable than text alone and use these to determine which aspects of songs are responsible for the facilitation of memory. The full study consisted of four different experiments that examined different aspects of music. The independent variable for all experiments was presentation type: spoken or set to music. The dependent measure was a recall task in which participants were to write as many of the words from the text as they could remember verbatim. This task was done immediately after the training trials (a short-term recall task) and twenty minutes later (a long-term recall task). Performance was analyzed for both the number of words correct, as well as the number of syllables and line breaks (to examine the effect of melody and phrasing).

Participants for the first three experiments were undergraduate students drawn from introductory psychology courses in partial fulfillment of course credit. Experiment 1 consisted of 64 participants, Experiment 2 had 21 participants, and Experiment 3 had 39 participants. Participants for the fourth experiment consisted of 48 business school students who received compensation for their participation. As part of the screening process, participants were asked if they recognized any of the titles of the ballads used in the study to ensure that nobody had any prior knowledge of them. Participants were also asked about their musical background. This information was used during the data analysis stage to examine whether musical training had any impact on results. Wallace found no significant differences in performance between those with musical training and those without it.
The texts used for the study were two three-verse ballads. Both ballads were recorded spoken normally and sung to music. In Experiment 1, participants heard either the spoken or sung version of one of the ballads in a five trial training task. Participants were asked to write down as many words as they could remember after the first, second, and fifth trial. Participants then underwent the same procedure for the second ballad; however, these results were not scored. This measure was included as a planned distraction task before the long-term recall task. Experiment 2 was almost identical to Experiment 1 except that the control stimulus was spoken rhythmically to the beat of a metronome instead of spoken normally. This test was included to see whether the success of the song condition was attributable to the rhythm of the words alone or if there were other aspects of music that contributed to memory. In Experiment 3, participants only heard one verse (spoken or sung) of the ballad (using a shortened version of the same stimuli from Experiment 1). This test eliminated the possible confounding variable of amount of exposure, as the melody repeated for all three verses. Thus, participants in the song condition of Experiment 1 had three times the amount of exposure to the melody than the control subjects did to the words of the text. For Experiment 4, a different three verse ballad was used. This experiment determined whether the melody needed to be consistent throughout the song in order to aid in recall, or if songs with different melodies for the verses were equally effective. Participants heard one of five tapes: the spoken version, the original melody, melody 1, melody 2, or a tape consisting of one verse each from the original melody and melodies one and two. Tapes consisting of just the original melody, just melody 1, or just melody 2 were combined into a one-melody group during analysis. Participants in Experiment 4 did not do a delayed recall task.
Experiment 1 showed that participants in the song condition remembered significantly more of the words than participants in the spoken condition for both short-term and long-term recall tasks. Participants in the song condition were also significantly more accurate in the number of syllables recalled and in the correct placement of line breaks; showing that participants in this condition not only remembered more words but also had a better representation of text structure. In Experiment 2, participants in the song condition once again recalled significantly more words in the short-term and long-term recall tasks, suggesting that music contributes more than rhythmical information. Participants in the song condition also scored better on measures of structure than participants in the rhythmic speaking condition, although not all results were significant. Experiment 3 showed reverse effects from Experiment 1, with participants in the spoken condition correctly identifying significantly more words and having less syllable errors than participants in the song condition. These results indicated that a melody needs to be well-learned in order to act as a memory cue; with little exposure, songs may actually be distracting during a recall task. In Experiment 4, participants in the one-melody condition recalled significantly more of the words than participants in either the three-melody or spoken conditions. They also had less syllable errors. Participants in the three-melody and spoken conditions scored similarly.

The study presented several interesting findings regarding the use of music to aid memory of text. Music provided an additional aid to facilitate memory, but only when certain conditions were met. When the melody was not well-learned (as when the participants only learned one verse or when the melody changed for each verse), music did not provide a benefit for memorization. Well-learned melodies can help people gain a deeper understanding of the structure of a text, including the number of syllables and line breaks. These cues can help people
recall more words and lines of a text during retrieval. These results have implications for future tests of music and memory. First of all, the finding that memory was not aided with single-verse music or music with melody changes highlights the need for multiple exposures to a song or melody in order for memory facilitation to occur. Another finding of the study was that lack of musical training did not affect the recall benefits of music. This finding is important for the use of music in the classroom, because it shows that cues like rhythm and melody are useful even for people who are not aware of them, such as kindergarten children.

Music has been successfully used in classroom interventions and laboratory experiments and was associated with increased performance on literacy and memory tasks over a control condition. Both Fisher (2001) and Cole and Hilliard (2006) found that music was connected to positive student attitudes and increased motivation over students in control conditions, which led to higher academic growth by experimental group participants. The rhythm and lyrics of songs were also found to strengthen phonics and word analysis skills, such as identification of medial and final sounds (Walton, 2014). Lastly, numerous studies have revealed benefits of music on memorization of words, including foreign phrases and unknown passages (Ludke et al., 2014; Calvert & Tart, 1993; Wallace, 1994). These researchers hypothesized that music provided an additional cue for encoding, retrieval, and rehearsal of words in memory. However, these studies have also discovered limitations of using songs for memorizing; for example, the need for multiple exposures so that a melody can be well-learned (Wallace, 1994). These factors will be taken into consideration in the design and discussion of the experimental strategy for this study.
Conclusion

While Watts and Gardner’s (2013) study made a strong argument in favor of high-frequency word training, a review of the literature did not yield one instructional method as the most effective. Regardless of the method used, high-frequency words need to be memorized if they are to become sight words – words that are automatically recognized. Several researchers found success using flashcard strategies and noted the traditional drill approach to be particularly efficient for the memorization of high-frequency words (Nist & Joseph, 2008; Volpe et al., 2011). However, for students with learning difficulties, a more involved mnemonic approach may be necessary to guide memorization, particularly for the spelling of irregular words. For example, students with learning disabilities were able to make significant gains in spelling while using a picture and story mnemonic strategy called “PESTS” (Howard et al., 2008). Therefore, the following study used a mnemonic approach to teach students who were below grade-level in literacy how to read and spell high-frequency words.

Due to the students’ interest in music and studies supporting the use of music in the classroom, sight word songs were used as the mnemonic strategy for this study. Researchers in early elementary classrooms found that the use of music increased students’ interest in instruction and that this heightened engagement led to academic gains (Fisher, 2001; Cole & Hilliard, 2006). Therefore, the use of sight word songs might enable a teacher to reach students who are not motivated to learn words, either due to lack of confidence or disinterest. Songs were also found to be powerful tools for memorization. Researchers hypothesized several explanations for music’s benefits, including the use of blending in lyrics to strengthen decoding skills (Walton, 2014) and the familiarity of a melody in encoding and subconsciously rehearsing a text (Calvert & Tart, 1993; Wallace, 1994). However, the use of music as a mnemonic strategy
for kindergarten vocabulary building was not common in the literature. Therefore, the following study sought to tie these findings together. By using a control and an experimental group, this study compared the efficacy of flashcard strategies to mnemonic devices, in particular music, for teaching at-risk students how to read and spell sight words. In addition to comparing instructional methods, this study also examined differences in reading and writing growth. The next chapter will describe these procedures in more detail.
Chapter Three: Procedure

The purpose of this research was to extend the existing literature on high-frequency word interventions by directly comparing traditional and non-traditional teaching methods. While the studies discussed in the previous chapter found positive results for both the use of flashcard methods to teach sight words and for the inclusion of music and mnemonics in the classroom, none of the studies used both of these methods to examine sight word learning. This study used a control and experimental group to answer the question of whether a non-traditional method was more effective than a traditional method in teaching at-risk kindergarteners how to read and spell sight words. This chapter outlines how this intervention was conducted. It provides information on the tests that were used for data collection as well as the materials used during the intervention. It also describes the procedures of the intervention, including how students were grouped, the schedule of the intervention, and what the teacher and students did during each session.

Pre-test Data Collection

Before beginning data collection, I obtained a signed informed consent form from the parent or guardian of each of the subjects. This form provided parents with information about the purpose and parameters of the intervention. Once the students’ informed consent was obtained, I administered the pre-tests. Testing consisted of three parts: a sight word reading test, a sight word spelling test, and a survey regarding student attitudes towards reading and writing. Two of these assessments were given one-on-one. For the sight word reading test, students were shown flashcards with all fifty kindergarten sight words from the Imagine It! curriculum (SRA, 2008) one at a time and had five seconds to say the word. As students were shown the words, I
marked on my recording sheet which words the student read correctly within the time limit (Recording Sheet can be found in Appendix A). Students also completed the Literacy Motivation and Confidence survey individually in an interview format as I marked down their responses (Survey can be found in Appendix B). Students pointed to the face that best represented their attitude as I read statements aloud to them. Participants completed the sight word spelling test individually but in a group setting - five students were tested at the same time. I chose ten of the sight words from the Imagine It! curriculum for students to write (words are listed in Appendix C). As I read the word aloud, students wrote the word on their answer sheet. Both groups were given the same ten words to spell.

Participants

Ten students participated in the experiment, all of whom were students in my kindergarten (K5) classroom. The students were all African-American and qualified for free or reduced-price lunch, reflective of the demographics of the school as a whole. Students were between five and six-years-old. Three of the subjects were boys and seven were girls. As mentioned above, these students were characterized as being below average in Literacy skills. None of the students had any information processing delays or IEPs.

Academic Characteristics. While the class as a whole was relatively similar in academic abilities and on or approaching grade level, the students in the intervention were on the lower end of the cluster. On the Winter Reading Measures of Academic Progress (MAP) test (Northwest Evaluation Association, 2015), the class average was a 152, one point higher than the national norm of 151. Of the students in the study, seven of the ten scored below average, while only three of the remaining seventeen students in the class scored below a 150 (see Table 3.1).
Math performance was more varied according to the topic being studied, and will not be factored into this study.

At the beginning of the study, the participants could identify close to all letter names and most letter sounds in isolation. In terms of Guided Reading, the students in these groups were very confident in using the picture and sentence patterns to help them determine words in beginning readers. However, they often neglected to use letter sound correspondences while reading and struggled with high-frequency words, causing them to over-rely on picture or semantic cues. At the mid-year administration of the Developmental Reading Assessment (DRA) (Beaver, 2004), none of the subjects were independent above a level 1; however, the school’s goal is for students to be independent at a level 6 by the time they are entering first grade (see Table 3.1). Part of these students’ difficulty in developing as readers was a lack of confidence in their ability to read. When asked to independently read an emergent reader text, these students would either fail to initiate reading or would make up words according to the picture. Lack of knowledge of sight words might have been a factor. While the number of sight words known by each of the participants varied, according to the March assessment, the participants knew less than twenty sight words on average, as seen in Table 3.1. The rest of the students in the class knew between thirty and fifty sight words. Another indicator of student literacy performance was weekly spelling tests. Spelling tests contained four word family words (which could be sounded out using basic letter-sound correspondence) and three sight words (which contained more complicated spelling patterns). With the exception of two participants whose parents placed heavy emphasis on studying for the tests (Students 8 and 9), the participants averaged a fifty-one percent, indicative of their ability to sound out the word family words but difficulty with spelling the three sight words (see Table 3.1).
writing common sight words carried over into other writing tasks throughout the day. For example, several of the participants particularly struggled during Writer’s Workshop, constantly relying on teacher and peer support.

Table 3.1: Literacy Data for Intervention Participants

<table>
<thead>
<tr>
<th>Student</th>
<th>Winter Reading MAP score</th>
<th>Mid-year DRA level</th>
<th>March Sight Word score</th>
<th>Spelling Test Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>147</td>
<td>Pre-A</td>
<td>13</td>
<td>48.71%</td>
</tr>
<tr>
<td>Student 2</td>
<td>147</td>
<td>1</td>
<td>21</td>
<td>67.89%</td>
</tr>
<tr>
<td>Student 3</td>
<td>161</td>
<td>1</td>
<td>15</td>
<td>66.22%</td>
</tr>
<tr>
<td>Student 4</td>
<td>143</td>
<td>1</td>
<td>13</td>
<td>53.76%</td>
</tr>
<tr>
<td>Student 5</td>
<td>153</td>
<td>1</td>
<td>23</td>
<td>53.38%</td>
</tr>
<tr>
<td>Student 6</td>
<td>142</td>
<td>Pre-A</td>
<td>5</td>
<td>41.72%</td>
</tr>
<tr>
<td>Student 7</td>
<td>146</td>
<td>1</td>
<td>19</td>
<td>40.35%</td>
</tr>
<tr>
<td>Student 8</td>
<td>159</td>
<td>1</td>
<td>17</td>
<td>84.38%</td>
</tr>
<tr>
<td>Student 9</td>
<td>144</td>
<td>1</td>
<td>24</td>
<td>79.68%</td>
</tr>
<tr>
<td>Student 10</td>
<td>146</td>
<td>Pre-A</td>
<td>13</td>
<td>33.40%</td>
</tr>
<tr>
<td>Median for Participants</td>
<td>146.5</td>
<td>1</td>
<td>16</td>
<td>53.57%</td>
</tr>
<tr>
<td>Median for the Rest of Class</td>
<td>153.0</td>
<td>3</td>
<td>40</td>
<td>88.85%</td>
</tr>
</tbody>
</table>

Other Strengths and Characteristics. None of the students had an IEP or exhibited any processing delays that may eventually lead to a referral. Most of the students were responsive and participated in all tasks without much additional prompting. However, four of the students (Students 1, 4, 6, and 10) had confidence issues and would not engage in activities when they felt they were not being successful. These students would turn in blank sheets of paper because they
did not know how to form words, or would stop reading and disengage when they came across a word they did not know. Due to their struggles, these students were frequently unmotivated to engage in literacy tasks unless they knew that they would have success.

In general, the participants were hands-on learners who were most successful when given very interactive tasks. Students strived in one-on-one or small group settings due to increased teacher attention and feedback. In smaller group settings, these students also had more opportunities to interact with materials and content which helped them to stay engaged. Students 2, 5, and 8 were particularly attentive during small-group instruction. The class as a whole was very kinesthetic and enjoyed music and dancing. For example, our school performs two school-wide music nights each year. The students were very engaged with learning the music and dances for the shows and were able to memorize the lyrics quickly, particularly Students 1 and 7. This interest in music prompted the experimental condition of learning sight words through songs and motions.

**Experimental Grouping.** Students were randomly sorted into one of the two conditions, with five in the control group and five in the experimental group. According to the pre-test data, these two groups did not differ significantly in their sight word reading ability (p=0.927) or writing ability (p=0.374) prior to beginning the intervention. On the sight word spelling test, only Student 9 got one word correct; the rest all scored a zero.

**Materials**

**Songs.** While a number of sight word songs are available online, I chose to create my own songs. I decided to write my own songs for several reasons. Primarily, I wanted to teach specific words - words with which these students struggled that were on our school’s list of
words that students should know by the end of the year. The *Imagine It!* curriculum (SRA, 2008) provides a list of twenty words that should be learned during K4 and thirty that should be learned in K5, with the expectation that students will know all fifty of these words by the end of K5. Writing my own songs gave me the flexibility to target all of the words that I wanted. I was also concerned about the length of some of the commercially available sight word songs. Due to the time constraints of the intervention, I wanted to use short chants that students could learn quickly. I also used beats or tunes to which I thought my students would be receptive given my prior knowledge of them.

Using the participants’ pre-test data, I chose fifteen words with which all ten students struggled (see Table 3.2). Most of these words were not known by any of the participants during the pre-test. Other words, such as “on”, were chosen because students should have known them by that point in the year, and even the students who did respond correctly on the pre-test were not confident in their answers (for example, these same students often confused it for “no” during reading). Additionally many of the words that none of the students knew began with the same letters (“h”, “t”, or “w”), so not all of these words were chosen to avoid potential student confusion. While all of the words were common words, most of them represented more abstract parts of speech and were therefore more difficult for students to learn. I created short songs or chants for each word, sometimes setting them to the tune of a familiar song or otherwise creating a new beat (song lyrics can be found in Appendix D). While the original intent was to teach the students eighteen sight words (three per week for six weeks), this was adapted to fifteen sight words (three per week for five weeks with one review week) due to the time constraints of the intervention. I did not want students to have to learn too much too quickly. For some words that were similar semantically and/or visually, I combined them into one song that stressed slight
differences between the words to help students tell them apart and grasp their different meanings. For example, the words “his” and “her” were presented together in one song to emphasize with which gender they were to be used; similarly “when” and “then” were combined into one song to highlight the distinction between their beginning letter and corresponding sound.

Table 3.2: Number of Participants to Correctly Read Each Word on Pre-test

<table>
<thead>
<tr>
<th>K4 Words</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>Go</td>
<td>9</td>
<td>In</td>
<td>3</td>
<td>The</td>
</tr>
<tr>
<td>And</td>
<td>5</td>
<td>Had</td>
<td>0</td>
<td>Is</td>
<td>6</td>
<td>Up</td>
</tr>
<tr>
<td>At</td>
<td>4</td>
<td>Have</td>
<td>1</td>
<td>On</td>
<td>3</td>
<td>Was</td>
</tr>
<tr>
<td>Can</td>
<td>8</td>
<td>He</td>
<td>3</td>
<td>See</td>
<td>7</td>
<td>With</td>
</tr>
<tr>
<td>Down</td>
<td>3</td>
<td>I</td>
<td>10</td>
<td>She</td>
<td>7</td>
<td>You</td>
</tr>
<tr>
<td>K5 Words</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>0</td>
<td>For</td>
<td>4</td>
<td>Look</td>
<td>9</td>
<td>There</td>
</tr>
<tr>
<td>Am</td>
<td>5</td>
<td>Girl</td>
<td>5</td>
<td>Of</td>
<td>0</td>
<td>They</td>
</tr>
<tr>
<td>As</td>
<td>5</td>
<td>Has</td>
<td>0</td>
<td>Out</td>
<td>2</td>
<td>To</td>
</tr>
<tr>
<td>Be</td>
<td>2</td>
<td>Her</td>
<td>0</td>
<td>Said</td>
<td>0</td>
<td>We</td>
</tr>
<tr>
<td>Boy</td>
<td>7</td>
<td>Him</td>
<td>0</td>
<td>Some</td>
<td>1</td>
<td>Were</td>
</tr>
<tr>
<td>But</td>
<td>1</td>
<td>His</td>
<td>0</td>
<td>That</td>
<td>0</td>
<td>What</td>
</tr>
<tr>
<td>Did</td>
<td>3</td>
<td>It</td>
<td>1</td>
<td>Then</td>
<td>0</td>
<td>When</td>
</tr>
<tr>
<td>Do</td>
<td>2</td>
<td>Little</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*words that are highlighted were used in the intervention

In almost every song, words were both spelled and presented in a sentence. Therefore, students could use cues from the song to help recognize and spell the word, as well as to
determine the meaning of the word from context. For words that could be sounded out phonetically, letter sound correspondences were also stressed. Additionally, almost every song had motions or hand gestures to go along with the words, although some had more than others (gestures described in boldface next to their corresponding lyric in Appendix D). Hand gestures were included to capitalize on the subjects’ strengths as kinesthetic learners. By singing a song and doing accompanying gestures as they saw each word presented on a flashcard, students were able to engage several different learning modalities as they learned each word: visual, auditory, and kinesthetic. Therefore all students in the experimental group partook in an activity that should have addressed at least one of their preferred learning styles.

**Other Materials.** While the sight word songs were created solely for the experimental group, both the experimental and the control group had access to other materials necessary for the intervention. Sight word flashcards from the *Imagine It!* curriculum (SRA, 2008) were used in both groups to provide a visual cue for each word. Both groups also used personal whiteboards, dry erase markers, and erasers for lesson activities involving the practice of spelling or writing the words in sentences.

**Procedures**

The intervention took place during ELA center time in the classroom, which occurred Monday through Thursday. During centers, small groups of students, grouped according to reading ability, rotated through six ELA activities, spending about fifteen minutes at each activity. Two of these centers, located on opposite sides of the room, were teacher directed; the rest were independent activities. The intervention occurred during the small-group activity that I led. Typically during my small-group, students worked on Guided Reading (reading books at
their instructional level with the support of the teacher). I chose to do the intervention during this time so that students in these groups would not miss out on any other instruction. For the two intervention groups, I adapted their centers schedule to incorporate sight word learning into the Guided Reading structure. Typically, on Mondays both groups spent all fifteen minutes learning sight words, on Tuesdays and Wednesdays students spent about five minutes reviewing words and the remaining time on Guided Reading, and on Thursdays both groups spent about ten minutes reviewing sight words and the rest on Guided Reading. Therefore, students in the intervention groups did not miss out on Guided Reading instruction, but instead, spent their pre-reading and extension activity time reviewing sight words that were already mastered by the rest of the class. This set-up also worked well because the books that were at the instructional level for these students were much simpler and shorter than the books read by the rest of the class, so these groups did not require as much time building background knowledge, decoding, or discussing the text. Both the control and the experimental group spent around thirty-five minutes on the intervention during a typical week. The amount of time spent on the intervention was affected by conditions in the classroom; for example, it was shortened during weeks in which we had days off or field trips or on days in which centers time was shortened due to other factors.

I arranged the centers schedule so that, while I was meeting with one group, the other group would be at the other teacher-directed center. I decided it best for the participants who were not with me to be at the other teacher-directed center for two reasons. First of all, these two centers were the most physically spread apart. This physical distance would impede students from accidentally overhearing as the other group practiced their words, thus precluding either group from gaining more exposure to the words outside of their group’s intervention time. Students also tended to get easily distracted when at the self-directed centers. By having
students at the Teaching Assistant-directed center, I ensured that she would be able to keep students on-task and stop them from listening in on other centers. It was especially important for the control group to be monitored during the experimental group’s intervention because I did not want the control subjects to intentionally or unintentionally pick up on the sight word songs. By having the students monitored and spread apart during the other group’s intervention time, I controlled for the potential confounding variable of amount of exposure to sight word instruction.

**Control Group Procedure.** Students learned sight words using a “see, say, spell, write” method. I would model each word by holding up a flashcard, saying the word, spelling it aloud, and then writing it on my whiteboard. After I modeled a word, students would practice using this same method. When prompted with a flashcard, they would say the word, spell it, and then write it on their boards. This method is the same procedure that was used when these words were originally taught whole-class during the beginning half of the year. Each time a word was introduced, students would go through this process three times in a row with teacher feedback. For words that were less familiar or often confused - for example, “were” (confused visually with “where” and semantically with “was”) - we would also discuss the meaning of the word and I would give examples of the word in context. Control group participants would then spend several minutes independently practicing writing and saying the word aloud to themselves before I moved on to the next word.

During review time, students reviewed words two ways: either by viewing a flashcard of a previously learned sight word and saying the word aloud, or by being told a sight word and spelling it on their boards. During some review sessions, students were also given a dictated sentence that included one of the intervention words which they were to write on their board.
Students practiced using both flashcards and whiteboards in order to satisfy both aspects of the intervention: increased reading and writing of high-frequency words. If students failed to recognize a word during review, they would be prompted to use the same “see, say, spell” strategy to practice the word before continuing with the review process.

**Experimental Group Procedure.** Students in the experimental group learned sight words by learning songs that focused on one word or two similar words. As mentioned above, songs not only included the spelling of the words, but also incorporated the meaning of words by using the words in context and sometimes having illustrative hand motions. Several songs also highlighted the orthographic structure of the words by referring to the letter-sound relationships and pronunciation. For example, the refrain of the song for the word “with” segmented the word into its three sounds – “/w/, /i/, /th/” - and then immediately provided the spelling of the word – “w, i, th” – to help the students link the sounds to the spelling (see Appendix D for full lyrics).

I would introduce the song by holding up the flashcard(s) and saying which word(s) the song would be about; then I would sing the song and do the corresponding hand motions at least once. For unfamiliar or confusing words, I would explain what the word meant and how they could use the information in the song to help them remember the meaning. As soon as the students got the beat and an idea of the lyrics, they would join me in singing the song and practicing the motions. Students would sing the song as a group three times. After practicing together three times, they would practice independently, similarly to the control group. Students would practice writing the word on the whiteboards, and were expected to sing the song to themselves to help them practice and remember the word.

The review process for the experimental group was almost identical to the review process for the control group. Students reviewed in two different ways: either by viewing a flashcard
and saying the word or by writing a word said aloud. When the experimental group practiced writing the words in context, they were given the same exact dictated sentences as the control group. If students in the experimental group failed to recognize one of the words during the review, I would prompt them by singing the corresponding sight word song. We would then practice this song as a group before continuing with the review process.

**Weekly Schedule.** Both the control and the experimental group learned the same three words each week and spent the final week reviewing all fifteen words. In addition to time spent learning new words, review time was built into each week. As the weeks went on and the number of words learned increased, more time was focused on reviewing all words than in the earlier weeks in which more time was spent learning new words. Both groups spent the same amount of time learning new words or reviewing learned words each day. Table 3.3 shows which words the groups learned each day and the amount of time that was spent on the intervention. For days in which students reviewed all learned words, the table also indicates whether students practiced reading or writing the words.
Table 3.3: Weekly Schedule

<table>
<thead>
<tr>
<th>Week One</th>
<th>Monday</th>
<th>15 minutes: learn “said”, “all”, and “there”</th>
<th>Tuesday</th>
<th>5 minutes: review “said”</th>
<th>Wednesday</th>
<th>5 minutes: review “all”</th>
<th>Thursday</th>
<th>5 minutes: review “there”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week Two</td>
<td>No school</td>
<td>2 minutes: review “said, all, there”</td>
<td>12 minutes: learn “what”, “of”, “with”</td>
<td>3 minutes: review “of”</td>
<td>3 minutes: review “with”</td>
<td>3 minutes: review “what”</td>
<td>6 minutes: practice writing all words</td>
<td></td>
</tr>
<tr>
<td>Week Three</td>
<td>2 minutes: flashcard review of all words</td>
<td>5 minutes: learn “were”</td>
<td>Field trip - no intervention</td>
<td>5 minutes: learn “they”</td>
<td>3 minutes: flashcard review of all nine words</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week Four</td>
<td>2 minutes: flashcard review of all words</td>
<td>5 minutes: learn “on”</td>
<td>6 minutes: review “when” and “then”</td>
<td>10 minutes: practice using words in sentences</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week Five</td>
<td>No school</td>
<td>5 minutes: flashcard review of all 12 words</td>
<td>5 minutes: learn “his”/“her”</td>
<td>5 minutes: review “had”, “his”, and “her”</td>
<td>5 minutes: flashcard review of all 15 words</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week Six</td>
<td>15 minutes: review of “what”, “had”, “of”, “then”, “when”, “all”, including writing them in sentences</td>
<td>10 minutes: review of “do”, “his”, “her”, “they”, including writing in a sentence</td>
<td>10 minutes: review of “said”, “there”, “with”, “on”, “were”, including writing them in a sentence</td>
<td>No intervention</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Post-test Data Collection

Post-test data collection was conducted in a manner similar to pre-test data collection. During the week following the sixth and last week of the intervention, the participants completed a one-on-one assessment of sight word reading ability using the fifty kindergarten sight word flashcards, which included all fifteen intervention words. Students also were surveyed on their attitudes towards reading and writing using the same Literacy Motivation and Confidence survey as before. All ten students also completed the sight word spelling test using the same format (two groups of five students tested at the same time) and words as the pre-test. All ten of these words were among the fifteen intervention words. All subjects who were present on that Tuesday were tested that day; students who were absent were tested the following day. Therefore, all students were tested within a day of each other, controlling for the potential confounding variable of time delay between the intervention and testing.

Conclusion

The experiment lasted for eight weeks. A week of pre-test data collection was completed in April, followed by six weeks of the intervention, and a final week of post-test data collection. After all the data were collected, I analyzed the results to compare performance and attitudes of participants in the control and experimental groups to each other and to pre-test data. The following chapter provides an analysis of the results. Results of the three dependent variable measures – the sight word reading test, the sight word spelling test, and the Literacy Motivation and Confidence survey – determined whether or not the hypotheses should be accepted or rejected.
Chapter Four: Results

Using information from the pre- and post-tests described in the previous chapter, the efficacy of the intervention was analyzed. This chapter displays the results from the intervention, beginning with results from the sight word reading test, then the sight word spelling test, and, finally, the Literacy Motivation and Confidence Survey. In each section, a comparison of the overall results as well as a breakdown by students and/or words are presented. These results help to answer the guiding question of whether music is an effective strategy for teaching at-risk kindergarteners how to read and spell common sight words.

Sight Word Reading Test Results

Students’ growth in reading high-frequency words by sight was determined using two measures. The Sight Word Reading Test consisted of all 50 kindergarten sight words from our Imagine It! curriculum (SRA, 2008); therefore, student results were analyzed using all fifty words as well as by using just the subset of 15 intervention words. Students’ post-test performance was first compared to results from the pre-test conducted prior to the intervention. The results for this one-tailed, paired samples t-test were significant at the p<0.05 level for both the experimental group (all 50 words: p=0.024; 15 intervention words: p=0.014) and the control group (all 50 words: p=0.016, 15 intervention words: p=0.012). These results indicate that the students made significant gains in their knowledge of sight words over the course of the intervention (see Figures 4.1 and 4.2 for a comparison of students’ mean performance on the pre-test and post-test). Therefore, substantial learning occurred in both the experimental and control conditions.
Comparison of Conditions. Students’ post-test performance was then compared across groups. This comparison was done to show whether the experimental strategy of singing was more effective than the traditional method, as hypothesized. The results of the one-tailed, independent measures t-test comparing the experimental group’s post-test performance to the control group’s performance were insignificant at the p<0.05 level for both the analysis of all fifty words (p=0.349) and the fifteen intervention words (p=0.464). This lack of significance means that the null hypothesis cannot be rejected; the singing intervention did not necessarily lead to increased student performance in sight word reading versus the traditional method.

However, the mean number of words learned by the experimental group was slightly higher on both measures: for all fifty words (experimental group: M=27.00, SD=11.00; control group: M=24.40, SD=9.476) and for the intervention words (experimental group: M=5.60, SD=3.362; control group: M=5.40, SD=3.362). These descriptive statistics indicate that the experimental group did have slightly higher rates of acquisition, especially considering that pre-test data were nearly identical for both groups (see Figures 4.1 and 4.2).
**Individual Results.** One reason for the lack of statistical significance may be the small sample size. The standard deviations were also high, indicating that student performance was quite varied. Analysis of individual students’ data could help to elucidate learning trends. When looking at the data of the individual participants in the experimental group, it appears that two students in particular – Student 2 and Student 5 – benefitted from the intervention, scoring above the group average on both measures - all 50 words and the 15 intervention words (see Table 4.1). While Student 5’s increase from knowing none of the intervention words to knowing two-thirds of them indicates that her growth was a result of the intervention, Student 2’s growth may be unrelated to the intervention strategy, considering that she also learned many non-intervention words during the experimental period. Although Student 1 did not learn many words overall, the trend in her growth indicates that the intervention strategy was an effective learning strategy for her. While she only increased by three words on the measure of all 50 words, she increased by five words when looking at just the intervention words, meaning that the only words she learned during the six weeks were intervention words and that she lost two non-intervention words. Two of the students in the experimental group - Student 3 and Student 4 - did not exhibit substantial growth, each learning only two of the intervention words.
Table 4.1: Number of Words Read Correctly by Members of the Experimental Group

<table>
<thead>
<tr>
<th></th>
<th>All Fifty Words</th>
<th></th>
<th>Fifteen Intervention Words</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-test</td>
<td>Post-test</td>
<td>Growth</td>
<td>Pre-test</td>
</tr>
<tr>
<td>Student 1</td>
<td>15</td>
<td>18</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Student 2</td>
<td>23</td>
<td>38</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>Student 3</td>
<td>18</td>
<td>20</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Student 4</td>
<td>13</td>
<td>19</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Student 5</td>
<td>24</td>
<td>40</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Experimental Group Mean</td>
<td>18.6</td>
<td>27</td>
<td>8.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Control Group Mean</td>
<td>18.4</td>
<td>24.4</td>
<td>6</td>
<td>0.6</td>
</tr>
</tbody>
</table>

By comparison, only two students in the control group displayed high levels of growth, learning more intervention words than the experimental group mean. While one of these students, Student 9, was already higher than the other participants in word knowledge and knew the most intervention words coming into the study (2 words), the other student’s growth (Student 7) seems to be attributable to the intervention.

**Song Analysis.** The results of the Sight Word Reading Test were also used to compare the performance for each word. Given that the songs used different beats and had a variety of features (ex: some used motions, others included phonological cues), I was interested in seeing if students in the experimental group learned to read some words better than the control participants because the songs for these words were more memorable. An analysis of the word learning trends did not find an impact of songs on which words students learned to read. The number of students in the control group who learned each word was within one of the
experimental group for all words, with the exception of “said” which was learned better by the control group (see Table 4.2). The near equal performance for the two groups suggests that none of the songs had special properties that led to more effective word learning by the experimental group, but rather, that some words were easier to learn in general. Instead, the length of the word appears to be a major determinant of how many students learned it, particularly for the experimental group, in which all of the two- and three-letter-words were learned by two or more participants but none of the four- or five-letter words were. The amount of exposure may have also been a factor for the control group. The two words learned best by the control group – “all” and “said” – were two of the three words introduced during the first week of the intervention, and subsequently practiced the remaining five weeks.

Table 4.2: Number of Students who Correctly Read Each Word

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Do</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>On</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Of</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>His</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Had</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Her</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Said</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>They</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>With</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

*the remaining five intervention words (then, there, were, what, when) were learned by one or less participants overall
Sight Word Spelling Assessment Results

Students’ gains in writing sight words were measured using the Sight Word Spelling Test, in which students were asked to write ten of the fifteen intervention words. First, student performance on the pre- and post-tests was compared for both groups. A one-tailed, paired samples t-test comparing the experimental group’s pre- and post-test performance was significant at the p<0.05 level (p=0.012). The fact that students scored significantly better on the post-test indicated that students made substantial growth in spelling sight words. The one-tailed, paired samples t-test for the control group approached significance at the p<0.05 level (p=0.071).

Comparison of Conditions. Once again, results from a one-tailed independent measures t-test comparing post-test performance of the control and experimental groups were not significant at the p<0.05 level (p=0.176). However, participants in the experimental group did learn more words on average (M=3.60, SD=2.302) than students in the control group (M=2.20, SD=2.168) (see Figure 4.3). Furthermore, the average point growth of the experimental group (3.6 points) was almost double the average point growth of the control group (2 points) (see Table 4.3). As with the reading test, the lack of significance on the t-test may be impacted by the small sample size. Additionally, the median for both groups (experimental: Md=4, control: Md=3) was higher than the mean (Md>M, negative skew), indicating that there were more high scores and that low scores were artificially lowering the mean. The effect of low scores may have particularly impacted the experimental group, considering that one student’s score of “0” was the only experimental group score lower than the overall average score. With a larger sample size, the increased performance of students in the experimental group may have been statistically significant.
**Figure 4.3:** A Comparison of Spelling Pre-test and Post-test Performance by Group

**Sight Word Spelling Results**

<table>
<thead>
<tr>
<th></th>
<th>Average Number of Words Spelled</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-test</strong></td>
<td><strong>Post-test</strong></td>
</tr>
<tr>
<td>Control</td>
<td>0.2</td>
</tr>
<tr>
<td>Experimental</td>
<td>3.6</td>
</tr>
</tbody>
</table>

**Individual Results.** The same students who made the most growth on the Sight Word Reading Test also had the most growth on the Sight Word Spelling Test. Students 2 and 5 scored the highest, learning how to spell 50% or more of the tested words, while Student 1 also scored above the mean (see Table 4.3). Although these students correctly spelled only half of the tested words, their performance was still impressive, especially considering that some of the easier intervention words (two-letter: “on”, “do”; phonetically spelled: “his”, “had”) were not included on the test. Students 3 and 4 displayed less growth in sight word spelling than their peers. Similar to the trend in the Sight Word Reading Test, Student 7 was the only student in the control group to score above the experimental group mean. The other four students in the control group scored a three or below, with two of the students not spelling any of the words correctly.
Table 4.3: Number of Words Spelled Correctly by Members of the Experimental Group

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student 1</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Student 2</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Student 3</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Student 4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Student 5</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Experimental Group Mean</strong></td>
<td>0</td>
<td><strong>3.6</strong></td>
<td><strong>3.6</strong></td>
</tr>
<tr>
<td><strong>Control Group Mean</strong></td>
<td><strong>0.2</strong></td>
<td><strong>2.2</strong></td>
<td><strong>2.0</strong></td>
</tr>
</tbody>
</table>

**Song Analysis.** Unlike what was found with the Sight Word Reading Test, the properties of some songs may have led the experimental group to learn how to spell some words better than the control group. In particular, there is a large disparity between the number of students who learned the word “of” in the experimental condition (4) versus the control condition (1) (see Table 4.4). This song contained a hand motion - put out right hand for “o”, put out left hand for “f” (see Appendix D) - that students used frequently to help them remember the song. The word “were” was also slightly better learned by students in the experimental group than students in the control group. Interestingly, “were” was the only one of the three songs that used familiar tunes to be tested on the Sight Word Spelling Test (the other two were “had” and “on”).

The remaining eight words were learned almost equally by members of the two conditions. Consistent with results from the Sight Word Reading Test, the word “all” was well-learned by all participants, perhaps because it is short and students had many opportunities to practice it.
Table 4.4: Number of Students who Correctly Spelled Each Word

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Of</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Were</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Her</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Said</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>There</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>What</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>With</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Then</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>When</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Survey Results

The Literacy Motivation and Confidence Survey was included as a more objective measure to supplement classroom observations of behavior and engagement during the intervention. The hypothesis was that the inclusion of music in instruction would lead to more positive attitudes towards learning and self-esteem by members of the experimental group. Overall, almost all of the student responses to survey questions remained the same from pre-test to post-test for experimental participants (see Table 4.5). This trend was present in the analysis of the mean group scores as well as in an analysis of individual student’s survey responses. The responses for the control group displayed a similar pattern. Therefore the hypothesis that singing
would lead to increased student motivation and self-confidence could not be confirmed through this measure.

Table 4.5: Experimental Participant Responses to Literacy Confidence and Motivation Survey

<table>
<thead>
<tr>
<th>Question</th>
<th>Average Response on Pre-test</th>
<th>Average Response on Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you feel about reading?</td>
<td>2.6</td>
<td>2.4</td>
</tr>
<tr>
<td>How do you feel about learning new words?</td>
<td>2.2</td>
<td>2.6</td>
</tr>
<tr>
<td>How good of a reader are you?</td>
<td>1.4</td>
<td>2</td>
</tr>
<tr>
<td>How do you feel about writing?</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>How do you feel about learning new words?</td>
<td>2.6</td>
<td>2.8</td>
</tr>
<tr>
<td>How good are you at writing?</td>
<td>1.8</td>
<td>2</td>
</tr>
<tr>
<td>Do you like knowing how to spell a lot of words?</td>
<td>2.6</td>
<td>2.6</td>
</tr>
</tbody>
</table>

*1= 😞 2= 😐 3= 😊

Conclusion

An analysis of the data showed that the null hypothesis should be accepted. This experiment was unable to prove that singing was a more effective strategy for kindergarteners to learn to read and write common sight words than traditional flashcard methods. However, students in the experimental condition did make significant gains in sight word knowledge over the course of the intervention. Additionally, students in the experimental group scored higher on average than students in the control group, particularly on the Sight Word Spelling Test. The next chapter will provide possible explanations for the results, connecting the findings to the literature discussed in Chapter Two. Chapter Five will also discuss some limitations of the study as well as implications for future research and recommendations for the individual students.
Chapter Five: Conclusions

The results presented in the previous chapter showed that the hypothesis that music was a more effective way for kindergarteners to memorize sight words could not be accepted. While students in the experimental group did make gains in their sight word reading and writing abilities, they did not significantly outperform the control group. Furthermore, survey data were inconclusive and could not be used to prove that the integration of music led to increased self-confidence and motivation for students in the experimental group. However, the study did provide several insights into sight word instruction and the use of music in the classroom. In this chapter, the findings from the study will be compared to the relevant literature discussed in Chapter Two. Explanations of the results will be offered for both the overall findings and the performances of individual students. Finally, strengths and limitations of the study will be noted along with suggestions for future studies and for instruction of the individual participants.

Connection to the Literature

As no published articles could be found directly comparing music to traditional methods of teaching sight words, this study was designed by analyzing the findings of both sight word instruction research and music research. While the hypothesis was not supported, the findings do align to those in the literature. For example, both Nist and Joesph’s 2008 study and Volpe, Mule, Briesch, Joseph, and Burns’ 2011 study found that traditional flashcard drills were an effective and efficient way for lower elementary students to learn to read high-frequency words. Participants in the control group of this study made significant gains in reading sight words during the intervention despite their slow growth over the first eight months of the year, consistent with the literature showing flashcard interventions to be effective. Although the
flashcard method was the same as that used in the traditional curriculum, the intensive small-group nature of the intervention may have led to gains. Perhaps one explanation for why the comparison of experimental and control group performance was insignificant was due to the effectiveness of the traditional strategy and not to the limitations of the experimental method. As the traditional method led to significant gains in control participants’ reading performance, the increased performance of the experimental participants was not sufficiently high enough to produce significant results.

On the other hand, the control group did not make significant gains in their ability to spell sight words, whereas the experimental group did. This discrepancy may also be explained through a comparison to the literature. While Howard, DeDeppo, and De La Paz’s 2008 study used the mnemonic strategy “PESTS” to teach high-frequency words, they only examined students’ ability to write these words. Mnemonic devices rely on a retrieval aid. Therefore, there may be a delay between a prompt and a student’s response as the student goes through the process of using the mnemonic. Students had only five seconds to respond to the prompt in the Sight Word Reading Test. Therefore, students from the experimental group may not have had enough time to link the visual cue to a song and use the song lyrics to identify the word. Conversely, student response times were not limited during the Sight Word Spelling Test, so students had enough time to go through the retrieval process and use the mnemonic to spell the word. Similarly, the studies that used music to help participants memorize passages involved more time-intensive tasks (Calvert & Tart, 1993; Wallace, 1994), in contrast to the automatic response required for sight reading. Perhaps music and other mnemonic devices are better suited for tasks that do not require automatic recognition, which may explain why mnemonic sight word reading interventions were uncommon in the literature.
One surprising result of the intervention was that the use of music did not lead to increased self-confidence and motivation, as measured through the survey. However, this finding does not necessarily contradict previous research. Neither Fisher (2001) nor Cole and Hilliard (2006) used survey data to show that the inclusion of music led to gains in motivation. Instead, many of these authors’ conclusions about the behavioral benefits of music were drawn from observational data. Similarly, student responses during this intervention suggested that students enjoyed the use of music, despite the survey findings. Students in the experimental group were generally enthusiastic about sight word practice sessions, whereas students in the control group were indifferent and preferred to spend time on Guided Reading. Additionally, two students in the control group – Students 7 and 8 - became extremely motivated during small-group once they realized that the other group was learning songs for the words, and they consistently asked when their group would start to learn the songs. When she realized that her group was not going to learn through songs, Student 7 even began to incorporate music into her learning on her own, singing the words to her own tune during independent writing practice time. Therefore, while it is not reflected in the survey data, students in this study did seem to have increased engagement through the use of music, similar to the students in Fisher’s (2001) and Cole and Hilliard’s (2006) studies.

**Explanation of Results**

As presented in the previous chapter, students in the experimental group did not significantly outperform students in the control group. However, students in both groups did make significant gains in their sight word reading abilities. Additionally, students in the experimental group made significant gains in sight word spelling, whereas students in the control
group did not. As discussed above, one reason for this finding may be that the song strategy was more effective for recalling words during the Sight Word Spelling Test than the Sight Word Reading Test because students needed more time to retrieve the songs. Another explanation may be that the songs, most of which began by saying the word, were more effective for cueing responses during the Spelling test, in which students were prompted by the teacher saying each word. As noted in Chapter Four, the lack of significance may have also been impacted by small sample sizes. An analysis of individual students’ performances may help explain the results further.

**Individual Results.** As shown in Chapter Four, Students 2 and 5 demonstrated the most experimental group growth for both reading and writing. These results align to classroom observations that these two students were the most focused during intervention sessions and were generally attentive during instruction. Furthermore, pre-test data showed they were slightly higher with regards to literacy skills than the other three experimental students at the start of the intervention (they both scored above twenty words). Therefore, they may have been more receptive to learning new words.

Although she did not learn as many words as Students 2 and 5, Student 1 also seemed to benefit from the singing intervention. Over the six week period, she learned more intervention words than words overall and learned to spell four of the ten tested words. The success of the singing strategy for her also aligned to classroom observations. Student 1 seemed to learn well using music both prior to and during the intervention, and she was always the first student to initiate songs as a retrieval strategy when the group was having difficulty recognizing a word. During testing, she could be seen using the song motions and running through the songs in her head to help her spell the words. While Student 1 was able to learn through the singing strategy,
she was also one of the students who struggled the most in the class, so the shift in her word knowledge (her inability to retain non-intervention words as she learned intervention words) may be related to cognitive load.

On the other hand, Students 3 and 4 did not make much growth. In contrast to the two students with the highest growth, these two students demonstrated the most unfocused behaviors. They often received redirections because they were not participating properly in the intervention. On several occasions they also missed all or part of an intervention session because they were sent back to their seats for behavior issues, in accordance with the school’s strict behavior management system. While Student 3 missed some sessions due to behavior, she did learn songs very quickly, which could account for her moderate growth in sight word spelling knowledge. However, Student 3’s lack of word reading growth was unexpected, especially considering that she was at the highest reading level of any of the ten participants, according to MAP Test data (Northwest Evaluation Association, 2015). Perhaps she would have exhibited higher rates of learning if she were tested on words in context - one limitation of the study was the use of the Sight Word Reading Test, which only tested words in isolation. Student 4’s lack of growth was less surprising, as she was one of the four students with confidence issues. During sessions, she would often wait for other students to provide the answer before she said a word. However, she did exhibit a shift in her test-taking behavior. At the start of the intervention, she did not attempt to spell any of the words on the pre-test, but on the post-test she made an attempt to spell all ten words. Perhaps increased exposure to these words led to improved confidence during test-taking.

By comparison, only one student in the control group (Student 7) made substantial growth on both sight word reading and spelling. This student is extremely musical, and once she
realized that the other group was learning songs for the words, she incorporated music into her learning by making her own sight word songs, as mentioned above. Therefore, while she was not a member of the experimental group, her gains in sight word growth may have still been attributable to an increase in motivation caused through the incorporation of music.

**Summary.** Through an analysis of individual student results and classroom observations, an explanation for the varied effectiveness of the intervention strategy became more transparent. Primarily, students who were more motivated by music in general (Students 1 and 7) seemed to be the most engaged with the singing strategy and therefore were able to learn more words. Furthermore, student behavior and participation impacted the results. Students who were attentive during the intervention were able to learn the songs better and therefore were able to apply the strategy to learn to read and spell new words. Students who were unfocused or missed sessions did not learn the songs as well and struggled to use the mnemonic device to help them read and write the words.

**Strengths and Limitations**

The study was a success in that it introduced a non-traditional teaching method into the kindergarten classroom. While some early childhood researchers have noted the importance of integrating music into kindergarten classrooms (Fisher, 2001), it can be difficult to find ways to meaningfully incorporate song, especially in schools with a rigid academic focus like the one in this study. Although students in the music condition did not significantly outperform students in the traditional flashcard condition, they were still able to make significant growth while using a fun, non-traditional method. Furthermore, the songs that were created for the study were enjoyable to the students. Participants in the experimental group demonstrated both excitement
to learn new songs and enthusiasm to rehearse previously-learned songs, sometimes singing them outside of intervention sessions.

Another strength of the study was the experimental and control group set-up. Unlike some intervention studies which look only at students receiving the experimental intervention, this study had a control group which enabled the use of objective statistical analysis to test the hypothesis. It is important to note that the control participants were still receiving instruction while the experimental students underwent the intervention. Instead of depriving these students of necessary instruction, they received an intervention consistent with the traditional classroom curriculum. Therefore, the researcher was able to assess the effectiveness of the new strategy while ensuring that all students were receiving quality instruction on a necessary skill for them to learn.

Lastly, a major benefit to this study was the incorporation of multiple learning modalities. Although the focus of the study was music (auditory), many of the songs included kinesthetic movements through the use of corresponding hand gestures. Incorporating movement helped to keep students engaged during song learning. Kinesthetic cues also provided an additional prompt for students to retrieve songs from their memory. For example, several students were observed putting their hands out when they heard the word “of” and then using this gesture to recall the spelling of the word. Therefore, although all of the participants were noted to enjoy music, different learning styles were still addressed to accommodate students who may have not preferred auditory learning.

However, if this study were to be repeated in the future, several important changes may need to be considered in order for the study to have successful results. One major limitation of this study was lack of time. Learning the songs was a process and, due to the expedited nature of
the intervention, students did not have many opportunities to practice songs before being expected to learn new ones. It is possible that the intervention strategy might have been working for the students but that they did not have enough time to fully learn the songs or express their mastery. Furthermore, due to the lack of time in the schedule, students were taught in groups of five. However, in many other sight word interventions (Nist & Joseph, 2008; Volpe et al., 2011), students were instructed one-on-one. If students were able to be instructed in smaller groups or individually, they could have had more opportunities to respond and could have learned the songs more at their own pace. Given that time was limited, it may have been too ambitious to attempt both a reading and a spelling intervention. Therefore, considering that the use of song was more effective for spelling, it may be beneficial to consider using the sight word song strategy only to teach spelling.

Another limitation of this study was the dependent measures that were used. First, the Sight Word Reading Test only assessed the ability to read words in isolation. However, students in the experimental group learned words in context through the lyrics of the songs. One explanation for why the control group performed better than expected on Reading could be that the testing format matched the instructional format (both in isolation), whereas the experimental group’s testing format (isolation) did not match their instructional format (context). A future study may benefit from a test that presents sight words in sentences, in addition to the use of the inventory assessment. The Sight Word Spelling Test could also be improved. The test only included ten words to accommodate kindergarten students’ attention span; however, this limit meant that there were no data for the other five words. Having data on all of the intervention words may have helped explain some of the results of the study. For example, the word “were” was well learned by the experimental group, and was also the only one of the three known songs
to be tested. Data for the words “on” and “had”, which also used known songs, could have helped determine whether the use of familiar songs was indeed beneficial. Finally, the use of the survey may not have been the best measure given the population of the study. Early childhood students do not truly understand the use of the survey and have not yet developed metacognitive skills necessary to reflect on their behavior and motivations. During the interview, many of the students answered automatically, seemingly not paying attention to the questions being asked, which led to inconclusive results. Observational notes provided more information about the attitudes and actions of the students in the study. It may also be worth considering asked more straightforward questions – for example, “what do you like better – learning through songs or flashcards?” – to assess student attitudes towards the intervention on a kindergarten level.

**Recommendations**

The findings showed that only students who were highly motivated by music and engaged in the intervention made large amounts of growth. Therefore, it may be beneficial for teachers to identify students’ preferred learning styles at the beginning of the year and provide differentiated strategies that meet their needs. While all of the participants in the study were noted to enjoy music, singing strategies, particularly in a small-group setting, did not necessarily work equally well for all students. However, some of the students – Student 1, Student 2, Student 5, and Student 7 - responded really well to the inclusion of music and made substantial growth in their sight word knowledge. The success of these students suggests that music should be used in the future as a learning strategy for them. A recommendation would be for these students to continue to use music to aid them in the mastery of Common Core Standard RF.K.3.C: “Read common high-frequency words by sight (e.g., the, of, to, you, she, my, is, are, do, does)” by learning or creating songs to help them remember other unknown words (National Governors
Association Center for Best Practices, Council of Chief State School Officers, 2010). They would also benefit from using a singing strategy in future grades to help them with other memory-intensive skills, such as Common Core Standard RF.1.3.A: “Know the spelling-sound correspondences for common consonant digraphs” (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010).

With the exception of Student 1, the lowest students at the start of the intervention (Students 1, 4, 6, and 10) were also the students to make the least amount of growth from the intervention. These students were also the students who were noted to have confidence issues that precluded them from attempting independent work and completing assessments. While this study sought to identify group intervention strategies that could help students reach grade-level and avoid future placement in Special Education, it is possible that these students require Tier 3 interventions. This concern may be particularly relevant for Student 4, whose fear of participation led her to not respond to prompts or practice singing until other students had already provided an answer or tune. Perhaps if she had received the singing intervention one-on-one and had more opportunities to respond she would have had more success in learning sight words. Similarly, while it is unknown how Students 6 and 10 would respond to the singing strategy as they were in the control group, it may be most effective for them to receive one-on-one interventions, in which they can receive more individualized attention.

Lastly, some students may benefit from more context-dependent sight word instruction. For example, Student 3 scored well on tests of reading despite having very low sight word scores. She may have been able to learn more words if they had been presented in sentences or low-level readers. Therefore, instead of focusing just on Common Core Standard RF.K.3.C: “Read common high-frequency words by sight”, an integrated approach targeting mastery of
CCSS.RF.K.3.C through focus on Common Core Standard RF.K.4: “Read emergent-reader texts with purpose and understanding” may work best for this student (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010).

Conclusion

The purpose of this study was to determine the effectiveness of a non-traditional strategy to teach kindergarten students to read and spell grade-level high-frequency words. Several students were identified to be at-risk for future Special Education services due to their below-grade-level performance and the fact that they were not making sufficient growth through the use of the traditional classroom curriculum. Due to the students’ interest in music, an intervention strategy using songs to teach the meaning and spelling of targeted sight words was developed. Participants were divided into an experimental (music) and a control (flashcards) group and their performance was compared.

Statistical tests revealed that the hypothesis that music is a more effective method for teaching sight words could not be accepted. However, the study still contributed insights into how best to incorporate music into sight word learning. First of all, the mnemonic aid of the songs appeared to be more conducive to learning sight word spelling than reading. The need for an automatic response for sight reading limits the ability of students to retrieve a song before they are required to respond. However, spelling of high-frequency words is often not timed. Students can replay the songs in their head when encountering words on a spelling test or when using words in their writing. Therefore, music may best be used to help students memorize spellings of difficult words. Furthermore, individual differences impacted the usefulness of the strategy. Only students who were highly engaged made significant growth. Therefore it may be
beneficial to assess students’ receptiveness to a musical strategy prior to beginning an intervention or to use one-on-one interventions with students who are unfocused. Finally, although experimental group performance was not significantly higher than that of the control group, students made significant gains from pre-test to post-test. Perhaps if some of the limitations of the study were addressed, particularly the length of the study, the benefits of the experimental strategy may be more pronounced.
References


National Reading Panel. (2000). *Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction*. Washington, D.C.: National Institute of Child Health and Human Development.


Stoller-Conrad, J. (2013). Why Do We Remember Countless Song Lyrics, But Not Our Studies?. *Figure One Blog.* Retrieved from https://figureoneblog.wordpress.com/2013/05/02/why-do-we-remember-countless-song-lyrics-but-not-our-studies/.


Appendix A

Sight Word Reading Test Recording Sheet

<table>
<thead>
<tr>
<th>Name: __________</th>
<th>Date: __________</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level Pre-K Sight Words (K4)</strong></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>go</td>
</tr>
<tr>
<td>and</td>
<td>had</td>
</tr>
<tr>
<td>at</td>
<td>have</td>
</tr>
<tr>
<td>can</td>
<td>he</td>
</tr>
<tr>
<td>down</td>
<td>I</td>
</tr>
</tbody>
</table>

/20

<table>
<thead>
<tr>
<th><strong>Level K Sight Words (K5)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>for</td>
</tr>
<tr>
<td>am</td>
<td>girl</td>
</tr>
<tr>
<td>as</td>
<td>has</td>
</tr>
<tr>
<td>be</td>
<td>her</td>
</tr>
<tr>
<td>boy</td>
<td>him</td>
</tr>
<tr>
<td>but</td>
<td>his</td>
</tr>
<tr>
<td>did</td>
<td>it</td>
</tr>
<tr>
<td>do</td>
<td>little</td>
</tr>
</tbody>
</table>

/30
Appendix B
Literacy Motivation and Confidence Survey

<table>
<thead>
<tr>
<th>Reading</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you feel about reading?</td>
<td>![Sad]</td>
<td>![Neutral]</td>
<td>![Happy]</td>
</tr>
<tr>
<td>How do you feel about learning new words?</td>
<td>![Sad]</td>
<td>![Neutral]</td>
<td>![Happy]</td>
</tr>
<tr>
<td>How good of a reader are you?</td>
<td>![Sad]</td>
<td>![Neutral]</td>
<td>![Happy]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Writing</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you feel about writing?</td>
<td>![Sad]</td>
<td>![Neutral]</td>
<td>![Happy]</td>
</tr>
<tr>
<td>How do you feel about learning new words?</td>
<td>![Sad]</td>
<td>![Neutral]</td>
<td>![Happy]</td>
</tr>
<tr>
<td>How good are you at writing?</td>
<td>![Sad]</td>
<td>![Neutral]</td>
<td>![Happy]</td>
</tr>
<tr>
<td>Do you like knowing how to spell a lot of words?</td>
<td>![Sad]</td>
<td>![Neutral]</td>
<td>![Happy]</td>
</tr>
</tbody>
</table>
Appendix C
List of Words for Sight Word Spelling Assessment

Sight Word Spelling Test

Teacher should read aloud the following words one at a time.

Students are to write each word on their own paper next to the corresponding number.

Do not move on to the next word until all students are ready.

1. then
2. her
3. what
4. said
5. of
6. were
7. all
8. when
9. there
10. with
Appendix D
Sight Word Song Lyrics and Motions

All

All. (Bring right arm around, as if grabbing everything)
I want it all. (Bring left arm around, as if grabbing everything)
A-l-l, All. (Hold hands in front as if carrying a lot of things)
That means everything!

Do

Do.
D-o, do.
What do you want to do? (Arms out, as if asking a question)
D-o, do.

Had
(to the tune of The Farmer and the Dell)

Yesterday I had, (Point behind for “yesterday”, hold hands in front for “had”)
Yesterday I had, (Point behind for “yesterday”, hold hands in front for “had”)
H-A-D spells had, (Point behind for “yesterday”, hold hands in front for “had”)
Yesterday I had - (students end the song by shouting out any object of their choosing to finish off the sentence “Yesterday I had __.”)

Her/His

Her, /h/. H-e-r. (Point to a girl - in the group on around the classroom)
“Her” is for a girl.
His, /s/. H-i-s. (Point to a boy - in the group on around the classroom)
“His” is for a boy.

Of

Of.
What is it made of?
Got an o and an f - that’s how you spell of!
Of.
It’s a word that I love.
Got an o and an f - that’s how you spell of!

Put out right hand for “o”, put out left hand for “f”
(Hands over heart)
(Put out right hand for “o”, put out left hand for “f”)
Appendix D continued

On
(To the tune of “99 Bottles on the Wall”)

On, on, o-n, on.
On, on, o-n, on.
On, on, o-n, on.
I’m sitting on a chair! (Point down at chair)

Said

I said s-a-i-d.
What’s that you said?
I said s-a-i-d,
that spells said! (Right hand making talking gesture)

Then/When

/W/, /w/, when. /w/, /w/, when. (Point to wrist, as if pointing to a watch)
W-h-e-n. When! (Point to wrist, as if pointing to a watch)
/W/, /w/, when. /w/, /w/, when. (Arms out, as if asking a question)
When do you want to play? When!
/Th/, /th/, then. /Th/, th/, then. (Point down, as if deciding on a time)
T-h-en. Then!
/Th/, /th/, then. /Th/, th/, then. (Point down, as if deciding on a time)
Then is when I’ll play. Then!

There

Where? Where? w-h-e-r-e. (Hand above eyes, as if searching the horizon)
Where? Where? w-h-e-r-e. (Hand above eyes, as if searching the horizon)
There! There! t-h-e-r-e. (Point to something in the distance)
There! There! t-h-e-r-e. (Point to something in the distance)
Where - /w/ - that’s wh,
There - /th/ - that’s th!
Where - /w/ - that’s wh,
There - /th/ - that’s th!

They

You take the word “the” (Put out left hand, as if placing the word)
and you add a y. (Bring right hand around to join left hand)
T-h-e-y...
they! (Point out, as if referring to the rest of the class)
Appendix D continued

Were  
(to the tune of “Jesus Loves Me”)

W-e-r-e that spells were.  
We were playing, yes we were.

What

What?  
What’s up?  
W-h-a-t -  
That’s what!  

(Both hands out, as if asking “what?”)

(Both hands out, as if asking “what?”)

With

With - /W/, /i/, /th/.  
w. i. th.  
With - /W/, /i/, /th/.  
w. i. th.  
Will you go with me?  
Yes, I’ll go with you.  
With - /W/, /i/, /th/.  
w. i. th.

(Both thumbs point inward at “me”)  
(Both pointer fingers point out at “you”)  

(Both thumbs point inward at “me”)  
(Both pointer fingers point out at “you”)

(The letters inside the “/” refer to the sound the letter makes. Letters on their own refer to letter names.)