

Early Reading Intervention
Word Families as a Strategy to Improve Decoding

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Abstract

The purpose of this study was to determine whether small group instruction on phonograms would positively affect the decoding skills of first graders who were identified as at-risk readers. The measurement tool was the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next Assessment. This study involved the use of a pretest/posttest design to compare student's winter scores on the nonsense word fluency subtest (before the intervention was administered) to their spring scores (after the intervention was complete). The study showed numerical gains in the students' pre and post-test scores compared to the control group that did not receive the intervention. There was no statistically significant difference between the performance of students who received word family instruction versus those students who received grade-level literacy instruction. Continued research in the effectiveness of phonograms to aid decoding is needed.

CHAPTER I

INTRODUCTION

Early literacy plays a pivotal role in a student's success in school and future career development. A student, who experiences reading delays in first grade, will probably continue to be a struggling reader. This puts the student at a disadvantage compared to more fluent peers. Unless a target intervention is administered to address this reading deficiency, a domino effect is likely to continue throughout the child's school career. This study evaluates the effectiveness of teaching word families as a strategy to improve the decoding skills of first grade students.

Overview

Students are taught to read in the primary grades and are then expected to use these literacy skills in their intermediate and secondary schooling. Some students complete the primary grades without mastering the fundamental reading skills they need to be successful at higher grade levels. The phrase "learn to read, read to learn" embodies this principle. Unless Students are proficient readers, their ability to grasp the content of their reading material is inhibited. This results in frustration and often leads to school failure or dropout.

This problem is pervasive throughout our society. Students live in a world requiring high levels of literacy to achieve success. The ability to read and comprehend text is critical to accomplishing everyday tasks. These skills are critical for success in school and in the workplace. The challenges and limited opportunities available to illiterate and functionally illiterate adults should ignite a movement for action in our schools.

As a first grade teacher in a Title One school, the researcher has witnessed the lasting effects of early reading delays. Mastery of fundamental reading skills should be the goal and expectation for every primary student. Teachers need to have an effective set of intervention

strategies to achieve this goal. In this study, the researcher investigated one potential strategy, using word families to help students reading achievement.

Statement of Problem

The International Reading Association identifies sound-letter correspondence and basic decoding strategies as two fundamental skills that have been found to support later reading achievement (Burns & Pierce, 2012). The problem is to identify effective techniques for developing these skills. What instructional strategies will improve decoding skills for students who are at risk for early reading delays? Does instruction in word families help students blend and decode words? Do students who receive direct instruction in word families decode better than students who do not receive this instruction? The purpose of this study was to determine whether direct instruction in the use of word families would significantly improve both the letter decoding skills and the word decoding skills of first graders.

Null Hypothesis 1

There will be no statistically significant difference in the letter decoding skills of students who receive direct instruction in the use of word families, as measured by their *DIBELS Difference Scores* on the Nonsense Word Fluency subtest of the *Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next Assessment* versus the *DIBELS Difference Scores* of a similar group of students who did not receive this intervention.

Null Hypothesis 2

There will be no statistically significant difference in the word decoding skills of students who received direct instruction in the use of word families, as measured by their *DIBELS Difference Scores* on the Nonsense Word Fluency subtest of the *Dynamic Indicators of Basic*

Early Literacy Skills (DIBELS) Next Assessment versus the *DIBELS Difference Scores* of a similar group of students who did not receive this intervention.

Operational Definitions

For the purpose of this study, the *ability of students to decode unknown words* was operationally defined as their score on the Nonsense Word Fluency subtest of the *Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next Assessment*. Their score on the Nonsense Word Fluency Subtest was the dependent variable used in this study. The independent variable was a small group intervention focused on recognizing word families and using them to decode unknown words. The *DIBELS Difference Score* in this study is defined as the difference in students' winter versus spring Nonsense Word Fluency Scores.

CHAPTER II

REVIEW OF THE LITERATURE

Educators have a responsibility to ensure that all students, regardless of socioeconomic status or other hindering factors have essential literacy skills that will enable them to be successful in school and beyond. Early reading intervention plays a key role in making reading and school success accessible for our most needing students. Strategies such as phonograms can help students develop early reading skills that will empower them to grow as readers and writers.

The following review of the literature focuses on five areas of investigation: 1) the importance of developing literacy skills at an early age, 2) the benefits of early reading intervention, 3) screening tools to identify at risk students, 4) the Nonsense Word Fluency Subtest of the DIBELS assessment, and 5) strategies to teach decoding skills.

Early Literacy Development

Research of early reading development has pointed to the five pillars of reading; vocabulary, phonics, phonological awareness, fluency, and comprehension as important literacy skills that must be developed for reading success. Children begin school with diverse ability levels in regards to these critical literacy skills. Additionally, the rate of subsequent reading growth also differs greatly among early readers. Children's socioeconomic status has a significant impact on their pre-school literacy skills as well as their rate of reading growth. Research suggests that there are multiple reasons for this discrepancy, including differences in the reading materials provided in the home, preschool programs, poor quality schooling following preschool, larger student to teacher ratios, higher teacher turnover, and less experienced teachers (Hangans, 2012). While schools can do little to remedy differences in pre-school experiences, they can employ early reading intervention for their at-risk readers.

Benefits of Early Reading Intervention

Reading research has suggested some significant findings that highlight the benefits of early reading intervention. Early intervention is more efficient and effective to intervention delivered later in elementary school. According to the National Institute of Student Health and Human Development, “it takes four times as long to remediate a student with poor reading skills in fourth grade as in late kindergarten or early first grade (Lyon and Fletcher, as cited in Hall, 2012). Secondly, research suggests that struggling early readers tend to lack critical early reading skills that they will only learn through a targeted reading intervention. Additionally, early reading intervention can greatly reduce the number of older students who are identified with learning disabilities (Hall, 2012). Lastly, reading intervention provided after grade three is more costly for school systems (Hoffman, Jenkins, Dunlap, 2009).

DIBELS as a Screening Tool for Early Intervention

Given the known benefits of early reading intervention and the critical role it plays in the child’s school success, it is imperative that schools identify at risk readers at an early age. For this reason school systems need to have effective assessment instruments available and readily used by teachers. Effective screening instruments have four characteristics: 1) they have met minimum research criteria as valid and reliable in identifying at-risk students. 2) they are teacher friendly. 3) they provide valuable information. 4) they take the shortest time possible to administer. (Hall, 2012).

One widely used assessment tool for identifying struggling readers is the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next assessment. This assessment is currently being used in districts with federal mandates as well as in many US and Canadian school districts. During the 2004-2005 school years, 8,293 schools used the assessment, totaling

over 1.7 million K-3 grade students (Hoffman et al., 2009). Although DIBELS is broadly used as a screening instrument, it does not thoroughly meet all four characteristics of an effective screening instrument. In particular, there are issues related to the validity and reliability of this assessment. According to a reviewer of the Buros' Mental Measurement Yearbook, "the evidence of reliability and validity is insufficient to support the use of the DIBELS to identify students in need of instructional intervention (Good, Kaminski, Moats, Laimon, Smith, Dill, 2002-2003). A second reviewer stated, "I find DIBELS to be useful for classroom and school decision making, but would consider it to be more trustworthy if it had information concerning the discriminant validity of the tests". This reviewer went on to state "teachers need to use the instructional recommendations derived from DIBELS as estimates-useful approximations as there are no data supporting the validity of the instructional categories used "(Good, et al, 2002-2003). The second reviewer suggested that DIBELS can be a useful data point when used in conjunction with other assessment measures for identifying at-risk readers.

Despite its issues concerning validity and reliability, DIBELS does meet the other three characteristics of an effective screening tool. The assessment is teacher friendly. It provides scripted teacher instructions and scoring procedures. DIBELS is also time sensitive in that it only takes 3 to 8 minutes per student to administer the assessment. Lastly, DIBELS provides valuable data in regard to basic literacy skills that are critical to accurate and fluent reading (Hall, 2012).

Nonsense Word Fluency Subtest

The Nonsense Word Fluency subtest or NWF is one component of the DIBELS Next assessment. It is the only subtest that is administered tri-annually in first grade. This subtest assesses two essential reading skills, letter sound correspondence and basic phonics. In this

subset students are asked to read CVC and VC nonsense words. The students are told that if they cannot read the whole word that they should tell any sounds that they know. Students receive two separate scores on this subtest: one for Whole Words Read (WWR), which is a measure of the number of words a student reads without sounding out the individual phonemes, and a Correct Letter Sound (CLS) score, which assesses students' knowledge of individual sounds even if they are unable to use those sounds to decode. The NWF subtest provides revealing data regarding a student's ability to decode unknown words. The use of nonsense words for this subtest eliminates the reader's ability to rely on memorized words that they instantly recognize. Decoding is a critical reading skill that is needed for reading success (Hall, 2012).

Decoding Strategies

Research suggests using phonograms to improve students decoding skills. Studies show that onset and rime are relatively easy to remember and splice back together. Children are more successful on breaking apart the onset and rime in a word than in breaking the word into individual phonemes (Fry, 1998). In his work, Fry states that one can safely conclude that phonics information is much easier for young readers to acquire when phonograms are taught than when a one-on-one blending process is taught. Johnston (1999) agrees with this viewpoint and goes on to explain that asking young readers to isolate the vowel or to use the vowel to sound their way through a word letter by letter, is asking them to do something that is very abstract and difficult, and often impossible. While readers do need to be able to isolate individual sounds as they progress in their reading, phonograms offer a friendly route to phonics understanding. Secondly, there is a utility to teaching phonograms. Fry (1998) explains that just 38 phonograms with added beginning consonants can make 654 different one-syllable words. These phonograms can also be found in many polysyllabic words. A third reason for teaching

phonograms as a decoding skill is that the vowel sound is more stable within a word family.

Pronunciations of vowel sounds can vary depending on environmental and geographical regions.

Pronunciations of vowel sounds can also differ depending on letters that come before or after the vowel. However, the pronunciation of the vowel sound tends to be stable within the word family (Johnston, 1999).

CHAPTER III

METHODS

Design

This study used a quasi-experimental design to examine whether phonogram instruction significantly influenced student ability to decode unknown words. The dependent variable used in this study was each participant's winter scores versus spring scores on the Nonsense Word Fluency Subtest. The researcher has labeled this difference the student's DIBELS Difference Score. The independent variable was a small group intervention focused on recognizing word families and using them to decode unknown words.

The design of this study included a treatment group and a control group. Each group was pre-tested and post-tested, using the DIBELS Next Nonsense Word Fluency Subtest. The treatment group received daily small group instruction on word families, in addition to grade-level instruction. The control group received grade-level instruction only. A possible design constraint in this study was that the treatment group and the control group received their grade-level instruction from different teachers. Another possible constraint was that there were gender differences between the treatment and control groups.

Participants

The participants in this study were fifteen first grade students from a suburban school system in Maryland. All participants tested intensive or strategic on the DIBELS Next Nonsense Word Fluency Subtest. Seven students from the researcher's class (three boys and four girls) were placed in a treatment group. Eight students from a different first grade class (six boys and two girls) comprised the control group.

Instrument

The DIBELS Next is a widely used assessment to identify at-risk readers. The assessment uses a norm benchmark to identify the level of support students are likely to need in their reading development. It classifies readers into one of three instructional categories: 1) At or Above Benchmark (Likely to Need Core Support), 2) Below Benchmark (Likely to Need Strategic Support), and 3) Well Below Benchmark (Likely to Need Intensive Support).

Although DIBELS is broadly used as a screening instrument, critics have questioned the validity and reliability of this assessment. Nevertheless, a reviewer cited in the *Buros' Mental Measurement Yearbook* (2002-2003) points out that it provides a useful data point, when used in conjunction with other assessment measures for identifying at risk reader.

Procedure

Students in two first grade classes at Tyler Heights Elementary School were assessed using the DIBELS Next Progress Monitoring assessment. Results from the Nonsense Word Fluency subtest identified fifteen students as needing strategic or intensive decoding support. This involved seven students in the researcher's class who were placed in the experimental group. It also involved eight students from the other first grade class, who were in the control group.

Students in the treatment group received daily small group phonogram instruction for a period of five weeks. Students engaged in a variety of phonogram tasks including word sorts, matching words to pictures, changing beginning sounds to make new words in the same word family, and word building activities.

All fifteen students were post-tested using the Nonsense Word Fluency subtest of the DIBELS Next assessment. A comparison of pre-test and post-test scores was conducted for both the experimental group and the control group.

CHAPTER IV

RESULTS

The primary purpose of this study was to determine whether there was a statistically significant difference in achievement among first graders who received word family instruction, in addition to their grade level literacy instruction, when compared to first graders who only received grade level literacy instruction. For purposes of this study, student achievement was based upon a comparison of students' pretest versus posttest scores in the experimental group compared to the pretest versus posttest scores of students in the control group. This study used a quasi-experimental pretest-posttest research design. The experimental group was comprised of students receiving word family instruction, in addition to grade level instruction. The control group consisted of students who received grade level instruction only. Small group word family instruction served as the independent variable. Students' performance on the Nonsense Word Fluency Subtest of the DIBELS Next assessment served as the dependent variable.

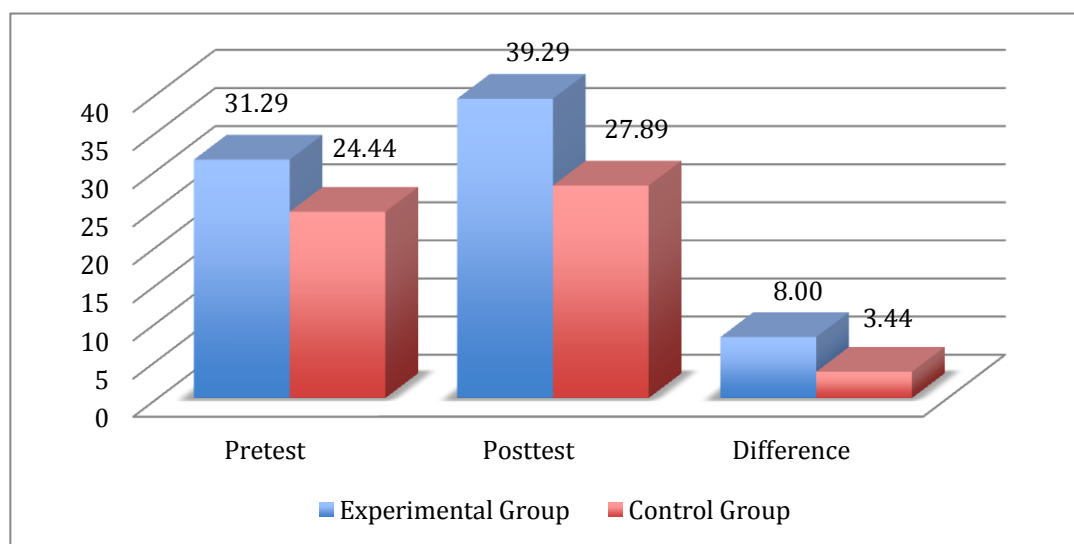
Table I below contains the group means, standard deviations, and pretest versus posttest differences in performance between the Experimental group and the Control group on the Correct Letter Sounds score of the Nonsense Word Fluency subtest of the Dynamic Indicators of Basic Early Learning Skills (DIBELS) assessment. These results are also displayed graphically in Figure A.

Table I

A Comparison of Students' Pretest versus Posttest Performance on the Correct Letter Sounds score of the Nonsense Word Fluency Subtest of the Dynamic Indicators of Basic Early Learning Skills (DIBELS) Assessment

	DIBELS Correct Letter Sounds Pretest	DIBELS Correct Letter Sounds Posttest	DIBELS Pretest vs. Posttest Difference
Students Receiving Word Family Instruction	31.29	39.29	8.00
Students Receiving Regular Literacy Instruction	24.44	27.89	3.44

Figure A



These results suggest that for students in the Experimental group, their mean difference in Correct Letter Sounds score increased by 8.0 points from pretest to posttest on the DIBELS Nonsense Word Fluency (NWF) subtest, compared to a mean difference score of 3.44 on the NWF DIBELS subtest among students in the Control group.

In order to determine whether the mean score difference from pretest to posttest was statistically significant, a *t* test for dependent groups procedure was used. The results ($t = 2.013$,

df =14, $p = .128$), suggests that there was no statistically significant difference between the performance of students who received word family instruction versus those students who received grade-level literacy instruction. Thus, the null hypothesis that there will be no statistically significant difference in the letter decoding skills of students who received direct instruction in the use of word families, as measured by their *DIBELS Difference Scores* on the Nonsense Word Fluency subtest of the *Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next Assessment* versus the *DIBELS Difference Scores* of a similar group of students who did not receive this intervention, was retained.

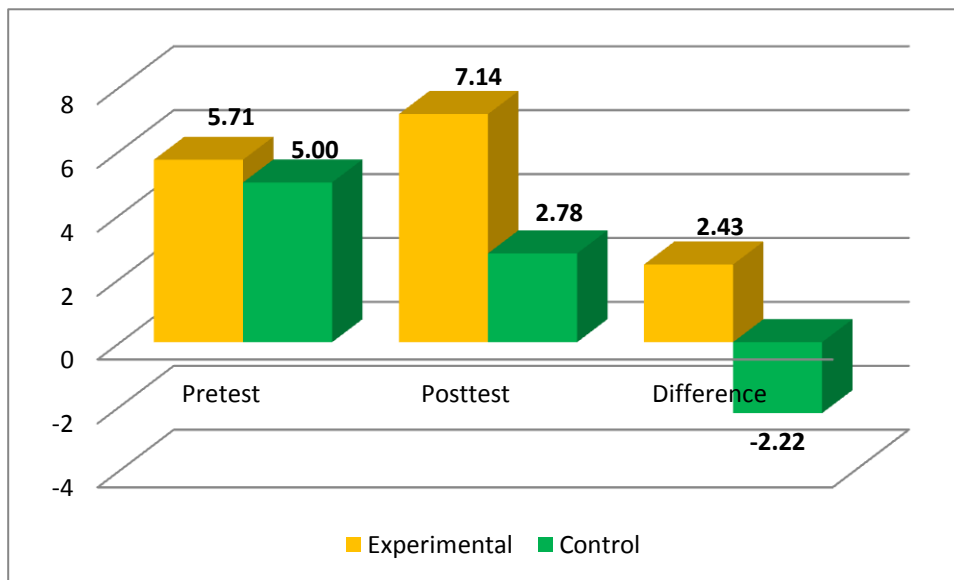
Table II on the following page contains the group means, standard deviations, and pretest versus posttest differences in performance between the Experimental group and the Control group on the Whole Words Read score of the Nonsense Word Fluency subtest of the Dynamic Indicators of Basic Early Learning Skills (DIBELS) assessment. These results are also displayed graphically in Figure B.

Table II

A Comparison of Students' Pretest versus Posttest Performance on the Whole Words Read score of the Nonsense Word Fluency Subtest of the Dynamic Indicators of Basic Early Learning Skills (DIBELS) Assessment

Groups Assessed	DIBELS Correct Words Read Pretest	DIBELS Correct Words Read Posttest	DIBELS Pretest vs. Posttest Difference
Students Receiving Word Family Instruction	5.71	7.14	2.43
Students Receiving Regular Literacy Instruction	5.00	2.78	-2.22

Figure B



These results suggests that for students in the Experimental group, their mean difference Whole Words Read score increased by 2.43 points from pretest to posttest on the DIBELS NWF subtest, compared to a mean difference score decrease of -2.22 on the DIBELS NWF subtest among students in the Control group.

In order to determine whether the mean score difference from pretest to posttest was statistically significant, a *t* test for dependent groups procedure was again used. The results ($t = 2.013$, $df = 14$, $p = .128$), suggest that there was no statistically significant difference between the

performance of students who received word family instruction versus those students who received grade-level literacy instruction. Thus, the null hypothesis that there will be no statistically significant difference in the word decoding skills of students who received direct instruction in the use of word families, as measured by their *DIBELS Difference Scores* on the Nonsense Word Fluency subtest of the *Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next Assessment* versus the *DIBELS Difference Scores* of a similar group of students who did not receive this intervention, was also retained.

CHAPTER V

DISCUSSION

The primary purpose of this study was to determine whether there was a statistically significant difference in the performance of a group of first graders on the DIBELS Nonsense Word Fluency subtest after receiving a target reading intervention focusing on the use of word families to aid decoding skills. Based upon the results reported in Chapter IV, while there was improvement in the performance of students who received letter and word decoding instruction, the amount of improvement was not determined to be statically significant when compared to the performance of the control group.

Threats to Internal and External Validity

Further analysis of the design of this study suggests that there were several potential problems of internal validity that need to be addressed. Gay & Airasian (2003) speak to a number of “extraneous” variables that can jeopardize the internal validity of this study. Among the threats to internal validity described in their research, the following factors may have been evident in this study.

A possible event that was not part of the experimental treatment, but may have affected posttest scores, was the fact that two experimental group participants received a daily tier 2 reading intervention, in addition to the small group word family intervention. A suggested solution is to exclude the scores of these two participants in order to eliminate this potential threat to internal validity.

Gender differences between the experimental group and the control group may have also affected posttest scores. Females in the experimental group accounted for 57% of the participants, compared to 25% in the control group. A suggested solution is to separately track

the test scores by gender. The test scores of female participants in the experimental and control groups could then be compared to the test scores of male participants in these two groups. That would help determine whether gender affected the overall results.

Participants were selected from already formed groups. The participants in the experimental group were students from the researcher's first grade class. The control group consisted of students from another first grade class. This could account for a potential initial advantage of the experimental group.

Based upon the design of this study, there were also several threats to external validity. Gay & Airasian (2003) refer to external validity as the extent to which outcomes from a study can be applied to other individuals and settings relying upon external validity factors.

Among the threats to external validity described in their research, the following factors may have been evident in this study:

Population validity

The participants in this study were from a Title 1 school. The majority of these participants were also English language learners. This is a potential threat to applying the results of this study to other population groups. A suggested solution is to acknowledge this concern, when in making generalizations from the results.

Multiple-Treatment Interference

Two students in the experimental group participated in an additional reading intervention. A second issue of multiple-treatment interference is that the students in the experimental group participated in the Accelerated Reader Program. These incidents of multiple-treatment could impact the extent to which the outcome of this study could be replicated in other settings.

Relationship of this Study to Previous Research

Previous research cited in Chapter II was used in the design of this study. First grade students were selected to participate in the study, because it has been demonstrated that early learners are more receptive to reading intervention than older students. According to the National Institute of Student Health and Human Development, “it takes four times as long to remediate a student with poor reading skills in fourth grade as in late kindergarten or early first grade (Lyon & Fletcher, as cited in Hall, 2012).

Hall’s research (2012) also showed that struggling early learners tend to lack critical early reading skills that they will only learn through a targeted reading intervention. The study used the DIBELS assessment, which Hall described as an effective screening tool to identify struggling readers and to monitor their progress. The study design also incorporates Fry’s research on the usefulness of phonograms in helping students to decode unknown words (Fry, 1998).

When assessing the external validity of this study, Hangans research on the impact of socio-economic status was taken into consideration. His research showed that socioeconomic status has a significant impact on their pre-school literacy skills as well as their rate of reading growth (Hangans, 2012).

Suggestions for Further Study

Future studies should seek to eliminate threats to internal and external validity. Specific suggestions include ensuring that participants do not receive additional interventions that could potentially affect their scores, eliminating significant gender differences between the experimental and control groups, and avoiding the use of preformed groups that have significant differences in core instruction or teacher expertise. The results of this study could also be more

meaningful if the research was extended to include students from non-Title I schools. An additional area for further investigation is whether or not word family instruction is a decoding strategy that is particularly beneficial for English language learners. Future research should also use a larger number of participants, to see if this impacts the statistical results.

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