A Dissertation

entitled

The Effects of an Orton-Gillingham-based Reading Intervention

on Students with Emotional/Behavior Disorders

by

James Breckinridge Davis, M.Ed.

Submitted to the Graduate Faculty as partial fulfillment of the

requirements for the Doctor of Philosophy Degree in Special Education.

________________________________________________________________________

Richard Welsch, Ph.D., Committee Chair

________________________________________________________________________

Laurie Dinnebeil, Ph.D., Committee Member

________________________________________________________________________

Edward Cancio, Ph.D., Committee Member

________________________________________________________________________

Lynne Hamer, Ph.D., Committee Member

________________________________________________________________________

Dr. Patricia R. Komuniecki, Ph.D., Dean

College of Graduate Studies

The University of Toledo

December 2011
An Abstract of
The Effects of an Orton-Gillingham-based Reading Intervention
on Students with Emotional/Behavior Disorders

by

James Breckinridge Davis, M.Ed.

Submitted to the Graduate Faculty as partial fulfillment of the
requirements for the Doctor of Philosophy Degree in Special Education.

The University of Toledo
December 2011

This study was performed with 4 male students enrolled in a specialized public
school for students with emotional/behavior disorders (E/BD). All of the students
participated in a 16-week, one-to-one, multisensory reading intervention. The study was a
single subject, multiple baseline design. The independent variable was an Orton-
Gillingham-based reading intervention for 45 minute sessions. The dependent variable
was the students' performance on daily probes of words read correctly and the use of pre-
and post-test measures on the Dynamic Indicator of Basic Early Literacy Skills
(DIBELS).

The intervention consisted of 6 different parts: (a) visual, (b) auditory, (c)
blending, (d) introduction of a new skill, (e) oral reading, and (f) 10-point probe. Student
behavior was monitored and scored throughout the lessons to compare the relationship
between behavior and the number of words read correctly.

The results of this study indicate a moderate positive effect on the decoding skills
for 3 of the 4 students on raw scores. The greatest improvement in decoding skills was
evident in the students’ performance on the Nonsense Word Fluency (NWF) task as measured by DIBELS.

The researcher was unable to detect a direct correlation between behavior and the number of words read correctly. Patterns suggest, however, that higher behavior scores tended to result in higher numbers of words read correctly.

Students and teachers were given questionnaires to measure satisfaction with the intervention. Three of the 4 students who participated in the study reported that they enjoyed working with the researcher, and 3 of the 4 teachers reported an increase in decoding skills transferred across academic areas, although none of the teachers reported any change in the students’ disruptive behaviors. The results of this study indicate that some students with E/BD and reading difficulties may benefit from the use of an Orton-Gillingham-based reading intervention.

Finally, the researcher presents the limitations to the study. Suggestions for further research are also given.
I dedicate this dissertation to my mother for her continuous and loving support and my father, Dr. William Jarman Davis, Jr. Unfortunately for him, none of his three sons became pilots, but he can be proud to say that one of his sons is also known as Dr. Davis.” I would like to thank him for our 5:30 AM chats and his motivational words of wisdom that helped me to continue with my education. From one dyslexic to another, he has taught me it does not take brains—just hard work and determination—to be successful.
Acknowledgments

I would like to thank my advisor, Dr. Richard Welsch, for making time for me and guiding me through the dissertation process. He was always available and our weekly meetings made it possible for me to complete the painstaking task of writing a dissertation. Without his input and guidance, I would have not been able to finish. Many other thanks to my committee members, Dr. Laurie Dinnebeil, Dr. Edward Cancio, and Dr. Lynn Hamer, who so graciously provided their academic expertise.

Special thanks to my friend and aide-de-camp, Catherine Huber. I would not have been able to complete this project without her organizational skills, humor, and strong support. She physically and emotionally helped me through this process, serving as my hands and personal taskmaster who motivated me every step of the way!
Table of Contents

Abstract ........................................ iii
Acknowledgements ............................ vi
Table of Contents ................................ vii
List of Tables ................................... xiii
List of Figures ................................... xiv

I. Introduction ................................... 1
II. Review of Literature ....................... 4
   A. Introduction ................................ 4
   B. Students with Emotional/Behavior Disorders 4
   C. Behavior Management ....................... 6
      a. The Premack Principle .................. 6
      b. Behavior management training ........ 6
   D. Effective Teaching Strategies for Students with E/BD 7
      a. Behavior-specific praise .............. 7
   E. Reading Instruction ....................... 9
      a. Phonological awareness ............... 9
b. Phonics 10
c. Fluency 10
d. Vocabulary 11
e. Comprehension 11

F. Approaches to Reading Instruction 12
   a. Bottom-up approach 12
   b. Top-down approach 13
   c. Interactive approach 14

G. Research with Students with E/BD and Reading Difficulties 14
   a. Group studies 15
   b. Individual Case Studies 16
   c. More recent studies 17
   d. Conclusion 18

H. Orton-Gillingham Method 19
   a. Brief history 19
   b. Language-based instruction 21
   c. Multisensory instruction 22
   d. Auditory method 22
   e. Visual method 23
   f. Tactile method 24
   g. Kinesthetic method 25
   h. Structured, sequential and cumulative instruction 26
   i. Cognitive instruction 26
   j. Flexible instruction 27
   k. Emotionally sound instruction 28
I. Orton-Gillingham Based Programs 28
   a. The Slingerland Approach 29
   b. Alphabetic Phonics 29
   c. Wilson Reading System 30
J. Research Support for Orton-Gillingham Reading Instruction 31
   a. Research with typical learners 31
   b. Research with at-risk learners 32
K. Social validity 33
L. Summary of Literature Review 34
M. Research Questions 35
III. Method 36
   A. Introduction 36
   B. Methodology and Approach 36
   C. Participants 37
   D. Setting 40
   E. Research Design 41
   F. Data Collection and Analysis 42
      a. Quantitative 42
      b. Definition and measure of reading 42
   G. Definition and Measure of Behavior 45
      a. Social Validity 46
   H. Researcher 48
   I. Definition of Independent Variable 50
   J. Interobserver Reliability/Treatment Fidelity 51
   K. Materials 53
L. Procedures: Reading Skills  
   a. Orton-Gillingham-based instruction  
   b. Description of student training  
   c. Outline of Daily Procedures  
M. Purpose and Description of Drills  
   a. Visual drill  
   b. Auditory drill  
   c. Blending drill  
   d. Skill lesson [introduction of a new skill or review]  
   e. Oral reading  
   f. 10-point probes  
   g. Maintenance probes  
   h. Review of lesson and behavior  
N. Summary  
IV. Results  
   A. Introduction  
   B. Interobserver Agreement for Daily 10-point probes  
   C. Procedural Integrity  
   D. Pre/Post-Test Measures  
      a. Student A  
      b. Student B  
      c. Student C  
      d. Student D  
   E. Daily Reading Probes  
      a. Student A
<table>
<thead>
<tr>
<th>Appendices</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Parent/Guardian Cover Letter and Consent Forms</td>
<td>113</td>
</tr>
<tr>
<td>B. Student Consent Form</td>
<td>119</td>
</tr>
<tr>
<td>C. Researcher's Weekly Schedule</td>
<td>122</td>
</tr>
<tr>
<td>D. 10-Point Daily Probes</td>
<td>123</td>
</tr>
<tr>
<td>E. Student Behavior Record Sheet</td>
<td>127</td>
</tr>
<tr>
<td>F. Daily Point Accumulation Record</td>
<td>128</td>
</tr>
<tr>
<td>G. Fulton Behavior Scale and Operational Definitions</td>
<td>129</td>
</tr>
<tr>
<td>H. Teacher Questionnaire</td>
<td>130</td>
</tr>
<tr>
<td>I. Student Questionnaire</td>
<td>134</td>
</tr>
<tr>
<td>J. Procedural Checklist (IO)</td>
<td>137</td>
</tr>
<tr>
<td>K. DIBELS Benchmarks</td>
<td>141</td>
</tr>
</tbody>
</table>
List of Tables

Table 1. Participants’ Characteristics .................................................................39
Table 2. Sequence and clusters of beginning reading skills ................................43
Table 3. Reward Allocation ...............................................................................46
Table 4. Interobserver Agreement for Daily 10-point probes .........................62
Table 5. Interobserver Agreement for Daily 10-point probes by Individual Student ..63
Table 6. Student A: Pre/Post-Test Measures .....................................................65
Table 7. Student B: Pre/Post-Test Measures .....................................................66
Table 8. Student C: Pre/Post-Test Measures .....................................................67
Table 9. Student D: Pre/Post-Test Measures .....................................................68
List of Figures

Figure 1. Student A: Probe Scores ................................................................. 72
Figure 2. Student B: Probe Scores ................................................................. 75
Figure 3. Student C: Probe Scores ................................................................. 78
Figure 4. Student D: Probe Scores ................................................................. 79
Figure 5. Student A: Behavior/Words Read Correctly ............................... 81
Figure 6. Student B: Behavior/Words Read Correctly ............................... 82
Figure 7. Student C: Behavior/Words Read Correctly ............................... 83
Figure 8. Student D: Behavior/Words Read Correctly ............................... 84
Chapter One

Introduction

In this study, the researcher was interested in measuring the effectiveness of an Orton-Gillingham-based intervention to improve the reading skills of students with emotional behavior disorders (E/BD) paired with reading difficulties. A review of the literature indicates that many students with the label of EB/D also have a high prevalence of some kind of learning disability or difficulties reading (Allen-DeBoer, Malmgren, & Glass, 2006; Nelson J. R., Benner, Lane, & Smith, 2004).

The English language is based on an alphabetic code. With this alphabetic code, everything heard, seen and felt can be transcribed on paper by the use of 26 symbols, or characters. These 26 characters in the alphabet, arranged correctly, make up the written language used in everyday life to access knowledge from a wide range of written mediums from signs, newspapers, magazines and books. It is essential for students to learn and understand this alphabetic code in order to function in society.

Reading is one of the most important skills a student must learn in school in order to progress in his/her academic career (U. S. Department of Health and Human Services, 2000). One of the primary reasons students are referred to special education programs is difficulty with reading (Taylor, 2000). Reading is a complex process to learn and teach, whereas a spoken language can be obtained by submersion and continuous interaction with others. Language involves specific rules that must be learned and followed in order to learn to read. In addition to learning the rules of a language, the phonetic structure of a written language, based on an alphabetic code, must be understood. Due to the fact that all students learn at a different rate and under different circumstances, it can be difficult
to design a program that accommodates all students in a single classroom. When teaching reading, it is important to use a program designed to teach the alphabetic code, beginning with the most basic components and progressing towards the more complex components. It is important for a student to learn the skill of reading early on in his/her educational experience because reading is the cornerstone to gaining access to new materials and concepts by decoding written text (Gillingham & Stillman, 2000).

Once a student has a firm grasp of the alphabetic code, he/she can become a fluent reader and be able to use reading as a tool to learning. Approximately 80-85% of students can learn how to read with little to no difficulties (Joshi, Dahlgren, & Boulware-Goode, 2002; Stewart, Benner, Martella, & Marchand-Martella, 2007). However, other students experience great difficulties learning how to read in the absence of a systematic, individualized reading program. If these students do not get the proper reading instruction, they are at a greater risk of displaying disruptive behaviors in the classroom and are at high risk for dropping-out of school. These students often fail to get along in society and, if not given the proper reading accommodations, are more likely to end up in the court systems (Sutherland, Lewis-Palmer, Stichter, & Morgan, 2008).

The older a student is, the harder it is for him/her to become a fluent reader. Because reading skills are expected to be obtained early on in school, the use of basic reading instruction is abandoned early on in the educational system in order for teachers to introduce new subjects and concepts requiring the use of reading.

In a national effort to help students with reading difficulties, Public Law 94-142 mandated that students with reading disabilities or attention problems have the right to a free, appropriate education plan and must be provided the proper accommodations to
meet their physical or psychological needs. It is the responsibility of the school system to provide such accommodations to help struggling students to overcome learning deficits. Under Public Law 94-142, students labeled as E/BD are covered under the Individuals with Disabilities Education Act (IDEA) (Individuals with Disabilities Education Act, 1990, Reauthorized July 1997).

Reading is the most researched topic in the field of education. Yet research on teaching reading to students with E/BD and reading difficulties is relatively rare (Oakes, Mathur, & Lane, 2010; Rivera, 2003). This study investigated the use of an Orton-Gillingham-based (OG) approach to teaching reading to students with E/BD and reading difficulties. Educators and researchers in the field of education are always looking for better ways to teach students who are having difficulties with reading. A great deal of research has been done to test the effectiveness of various teaching techniques with students who have specific learning disabilities (LD) such as dyslexia and Attention Deficit Hyperactivity Disorder (ADHD); although little research with few high-quality studies have been performed with students having emotional/behavior disorders (Benner, Nelson, Rolston, & Mooney, 2010; Rivera, 2003).

Teaching students with E/BD is a particularly challenging task, however. Because little research has been performed with students with E/BD and reading difficulties, an emerging area of research is to test various teaching methods in order to determine which methods are the most effective when teaching this population (Richey & Goeke, 2006; Rivera, 2003).
Chapter Two

Review of Literature

Introduction

The following chapter is a presentation of the academic literature regarding students with Emotional Behavior Disorders (E/BD) and difficulties with reading. Characteristics of both groups are identified and described. Descriptions of research studies performed with students who have E/BD paired with reading difficulties are given. Included is a description of essential components necessary to become a competent reader. A brief history of the Orton-Gillingham (OG) approach is given along with a description of the OG method. Additional reading programs that have stemmed from the works of Samuel T. Orton and Anna Gillingham are outlined and discussed. Scientific research studies that support the effectiveness of the Orton-Gillingham approach are reviewed. Research studies mention the high correlation between students with E/BD and reading deficits, yet few studies examine both of these variables together.

Students with Emotional/Behavior Disorders

The DSM-IV diagnostic category of Emotional/Behavior Disorders (E/BD) is also referred to as Emotional Disturbance (ED) and Behavior Disorders (BD) throughout the literature (DSM-IV-TR, 2000) In this study, students with behavior problems and/or emotional disturbances are referred to as students with E/BD.

In order to qualify for special educations services through IDEA, students with E/BD must meet one or more of the following criteria; (a) an inability to learn which cannot be explained by intellectual, sensory, or health factors; (b) an inability to build and maintain satisfactory interpersonal relationships with peers or teachers; (c) inappropriate
types of behaviors or feelings under normal circumstances; (d) a general pervasive mood of unhappiness or depression; and (e) a tendency to develop physical symptoms or fear associated with personal or school problems (P. L. 94-142, Federal Register, 1977).

Many students with E/BD develop social and emotional difficulties early on in their academic careers because they have frustrations with learning and display inappropriate behaviors. A study performed assessing reading abilities found that students who experienced reading difficulties in the first grade exhibited more antisocial behaviors than students without reading difficulties (Sutherland, et al. 2008). Nelson, et al. (2004) studied a sample of students with E/BD and found that 83% scored below the norm group on a standardized measure of reading skills. Students with E/BD are making less academic progress compared to their non-disabled peers and are even scoring below individuals with learning disabilities (Anderson, Kutash, & Duchnowski, 2001). Miles and Stipek (2006), after studying students with reading and behavior problems, hypothesized that much of the aggression and antisocial behaviors stem from the students’ frustration with their inabilities to achieve academically. As a student gets older and begins to realize he/she has fallen further behind peers, he/she tends to give up and resort to problematic behaviors to hide their insecurity and inability to perform academically (Sutherland, et al. 2008).

Trzesniewski, Moffitt, Caspi, Taylor and Maughan (2006) found that behavior problems and learning difficulties are not causally related, but may come from a similar developmental antecedent. Although reading and academic difficulties may exist, a student’s familial and environmental factors can play a role in whether the student displays antisocial behaviors.
**Behavior Management**

When working with students with E/BD, it is important to have a behavior management system in place to help to minimize disruptive behaviors (Benner, Nelson, Rolston, & Mooney, 2010). An effective behavior management system should have specific rules and guidelines with well-defined consequences and expectations (Sutherland & Morgan, 2003). There are several techniques to manage disruptive behaviors. Such techniques include: Social Skills Training (SST) to alter social skills, improve self-control, and increase interpersonal relationship skills (Gresham F. M., 1998); Replacement Behavior Training (RBT) to teach students how to replace negative behaviors with more appropriate behaviors (Maag, 2005); and Behavior Management Training (BMT) to teach self-management skills (Meadows & Melloy, 1996).

**The Premack Principle.** Providing positive reinforcement in the form of tangible and intangible rewards can be an effective way to motivate students (Wray, Medwell, Fox, & Poulson, 2000). One method commonly used with when working with students with EBD is known as The Premack Principle. According to the Premack principle, a person is more likely to engage in a less desirable behavior if a more desirable behavior is dependent upon completion of the less desirable behavior. This means a desirable behavior can be used as a reinforcer of an undesirable behavior. Premack hypothesized that the relatively undesirable activity would gradually become a more desirable activity because it is followed by and associated with the desirable behavior. For example, if reading is not a desirable task for a student, a tutor can increase the desirability of reading by rewarding the student with a more desirable behavior such as shooting a basketball or playing a game following 10 minutes of reading (Premack, 1959). The Premack principle
is an appropriate way to work with students with E/BD and reading difficulties because these students are likely to consider reading to be a less desirable behavior.

**Effective Teaching Strategies for Students with E/BD**

When working with a student with E/BD, it is important to know the student. Teachers need to reinforce positive behaviors, establish good relationships, and understand the students‘ needs by helping them to manage behaviors (Abrams, 2005). Students with E/BD need to learn self-management skills and accept circumstances in order to maintain self-control and act using appropriate behaviors. Students with E/BD often have difficulties problem-solving, negotiating and completing complex tasks. As a result, students with E/BD resort to negative behaviors in order to avoid work due to frustrations regarding the material presented. Students with E/BD can become reactive and highly emotional with an inability to control behaviors. As a teacher, it is important to be aware of warning signs before a student becomes overly-emotional or physically aggressive towards the teacher or other students (Abrams, 2005).

**Behavior-specific praise.** Another effective way to help students with E/BD in the classroom is by the use of behavior-specific praise. According to Kalis et al. (2007), the use of behavior-specific praise has been found to help increase student motivation and performance. More specifically; the use of behavior-specific praise tends to be more effective than general praise (i.e. –good job” or –excellent work”). Behavior-specific praise seems to have a better effect on students with E/BD because it helps them understand exactly what they are doing that is worthy of praise (i.e., –Christopher, I like the way you are sitting quietly and raising your hand before responding”). Such positive
behavior-specific praise helps the student with E/BD to receive reinforcement from positive behaviors which can help to increase positive behaviors in the future.

Teacher praise is a natural, non-intrusive way for teachers to express satisfaction in their students’ behaviors. The use of praise instead of reprimands has been found to increase on-task behavior. Punishment tends to increase disruptive behaviors (Sutherland, Wehby, & Copeland, 2000). For teachers to provide quality instruction, it is important to help students with E/BD to become proactively involved in a lesson. Students with E/BD tend to be overlooked by teachers due to past negative behaviors.

When teaching reading it is also important to provide specific praise to help the student to identify what they have done correctly. Such praise can help to increase students’ confidence and reinforce the behaviors in the future (Masons, 2008).

In summary, findings indicate there is a correlation between effective teaching practice and a student’s ability to exhibit good academic performance and behaviors. Effective teachers give attention through positive means rather than reprimands for negative behaviors (Sutherland, et al. 2008). Overall, the use of praise has been researched and found to have a positive effect on students with E/BD. The use of praise has been under-used by special education teachers. Increasing the level of praise in a classroom can decrease negative behaviors and increase student performance (Kalis, Vannest, & Parker, 2007). When teaching reading it is important to provide positive feedback and praise so the student will understand what they are doing correctly and reinforce reading performance in the future (Masons, 2008).
Reading Instruction

**Phonological awareness.** Sodoro, Allinder, and Rankin-Erickson (2002) refer to phonological awareness as an essential skill to becoming an effective reader. Phonological awareness is the ability to detect and manipulate differences in language sounds. A student’s phonological awareness includes his/her ability to rhyme words, identify the number of phonemes in a word, and the ability to recognize that although a word may rhyme, it can have different beginning sounds. For example, the words “sing” and “ring” rhyme, yet they have different beginning sounds. A student with poor phonological awareness may get confused using the onset letter such as “s” or “r” to come up with a rhyming word rather than using the “ing” or the rhyme of the word (Boyle, 2008).

Marilyn Adams (1990) breaks down phonological awareness into five different subcategories or levels a student needs to learn in order to achieve phonological awareness. The first level is having an ear for sounds, such as with the rhyming task, and a sense of pattern in rhythm and song. The second level deals with auditory tasks such as being able to identify rhymes from a list of words such as “pan,” “ean” or “mop”. The third level is the ability to blend groups of phonemes together to form words. An example is the ability to blend letters together such as /c/ /a/ /t/ to properly pronounce the word “cat”. The fourth level of phonemic awareness is the ability to isolate individual phonemes. One example is to have a student say the word “eook” without the phoneme for the letter “e” and pronounce the blend “eok”. The final level of phonological awareness is the ability to segment words into different phonemes. For example, the phonemes /c/ /a/ /sh/ can be blended together to form the word “eash” (Adams, 1990).
deficit in any of these levels of phonological awareness can result in a student's inability
to decode words and misread words in a passage reducing the student's level of
comprehension. Phonological awareness training is an important technique for teaching
students with reading deficits, and the use of phonological training can help to develop a
student's novice reading skills into competent reading ability (Sodoro, Allinder, &
Rankin-Erickson, 2002).

While assessing students for reading difficulties, it is important to gain an
understanding of their phonological awareness as this is a good predictor of reading
ability. A student with poor phonological awareness may have a reading disability and
need alternative teaching methods to compensate for a phonological deficit. When a
student is not reading at the appropriate grade level, it is important to identify the
student's specific deficits before he/she falls further behind. Vaughn et al. (2008) found
that skilled readers have a high degree of phonemic awareness. This supports the
importance of teaching phonological awareness to students early on in school.

Phonics. Phonics refers to grapheme and phoneme correspondence. Students with
reading difficulties tend to have problems linking phonemes to their corresponding
graphemes. Phonological awareness refers to an auditory understanding whereas phonics
focuses more on the written aspect of language orthography (Boyle, 2008).

Several studies found that teaching phonics can be an effective way to teach
young students how to read; although it is not recommended for use in isolation when
teaching reading. Research suggests that pairing phonics along with age-appropriate
reading materials may be a better way to help struggling readers (Gillingham & Stillman,
2000; Gunning, 2008). In some parts of the United States, phonetics programs are
mandated as part of reading instruction curriculum (Louden et al., 2005). Adams (1990) believes the use of teaching phonics is irrelevant if the skills are not used in the context of reading and writing. The memorization of rules and individual sounds can be helpful in achieving phonological awareness. Yet if a student is not presented with books and actively applying knowledge of phonics to reading, the time spent learning phonics rules will not be generalized to a student’s ability to read (Allington et al., 1991).

Fluency. Another important aspect of becoming an effective reader is fluency. Reading fluency refers to a person’s ability to read text with speed and accuracy. Reading fluency has been found to be an essential link to analyzing text in order for a student to be able to exhibit good comprehension. When an individual has difficulty with reading fluency, it can result in an inability to comprehend what they are reading. Too much energy is focused on decoding and word recognition, resulting in the meaning of the text being lost. Students identified as having reading difficulties also have deficits in word-naming tasks, using a great deal of working memory when decoding words, resulting in a loss of comprehension (Sodoro, Allinder, & Rankin-Erickson, 2002). Decoding is a necessary skill for students to obtain in order to become effective readers and transfer the written word into meaningful information.

Vocabulary. Vocabulary is the ability to understand the use of a word or meaning of a word in context (Coyne, Zipoli, & Ruby, 2006). Just as fluency is important in becoming an effective reader, so is vocabulary. Although students may have the ability to decode words, they may not have an understanding of what they are reading due to limited vocabulary. Some students who are good readers may have a poor vocabulary due to a lack of experience with or exposure to oral language. Because words are a group of
graphemes that have a significant meaning, lack of understanding of a word in text can result in poor comprehension.

**Comprehension.** Reading comprehension includes good phonological awareness, the ability to decode words using phonics, having reading fluency and having an enriched vocabulary in order to gain the meaning of what is being read. According to Coyne, Zipoli and Ruby (2006), comprehension is a complex cognitive process that involves the intentional interaction between reader and the writer of the text in order to construct meaning. Comprehension involves the use of relating prior knowledge in order to understand the main idea or summarize what has been read. The reader should use organized comprehension strategies to access the meaning of the text (Vaughn, Linan-Thompson, Bryant, Dickson, & Blozis, 2008). Vocabulary combined with fluency is how effective readers can create meaning from a passage of written text. Comprehension involves applying all of the skills listed above in order for a person to organize and gain an understanding or meaning of a written passage.

**Approaches to Reading Instruction.**

Teaching reading is a complex process and there are several philosophies on the best way for teaching students to become effective readers (Boyle, 2008). Over the years, researchers have come up with three broad approaches or strategies for teaching reading. These strategies are a Bottom-Up approach, a Top-Down approach and an Interactive approach.

**Bottom-up approach.** The bottom-up approach refers to teaching literacy by first teaching students the names and the visual representation of letters in the alphabet. The next step is to teach the consonant sounds followed by the long and short vowel sounds,
gradually introducing more complex vowel sounds and vowel combinations. As a student achieves mastery of the letter sounds, he/she will continue to build on his/her knowledge of phonics and work on blending sounds together in order to create words.

An assumption of the bottom-up approach is that many students will have difficulties becoming successful readers without having a general understanding of language orthography along with the knowledge about letter sounds and phonics. As students progress in their awareness of letter sounds and phonics, they will gain a better understanding of trends and complexities of a written language. The foundational knowledge of phonics can increase a student's ability to decode words. The bottom-up approach is the process of decoding language by separating it into the smallest components in order to achieve literacy (Gunning, 2008).

**Top-down approach.** In the top-down approach, learning to read is understood to be similar to that of learning language. When a student is presented with all parts of a language, whether or not he/she understands all of the words being used, he/she can still obtain meaning from what is being conveyed. Essentially, the assumption is that background knowledge can be used to fill in any gaps in comprehension. The top-down approach is considered a holistic process because the student learns to read through immersion in written text rather than by the breaking down of words into component parts as in the bottom-up approach. The student learns to read based on his/her background knowledge of the spoken language. The theory of the top-down approach assumes that the use of phonics unnecessarily fragments the words, making reading abstract and confusing. In the top-down theoretical perspective, there is no need for direct, explicit instruction in order for a student to learn how to read. Rather, the student
relies on context and syntactic clues to decipher the words into meaning, resulting in comprehension (Gunning, 2008).

**Interactive approach.** The interactive approach uses a combination of both the bottom-up and the top-down approaches. Like the bottom-up approach, the interactive approach uses direct, explicit instruction in early reading education in order to teach the fundamentals of phonics. Once the fundamentals of phonics are learned, interactionists present a more holistic approach, employing the teachings of the top-down theorists, and begin supplying the students with age-appropriate reading materials to be decoded using learned phonics skills. This combination of both approaches provides a more effective way for students to obtain reading skills (Gunning, 2008). The Orton-Gillingham approach is considered an inter-active approach to teaching reading.

**Research with Students with E/BD and Reading Difficulties**

Reading disabilities account for 80% of all learning disabilities. Although the field of reading disabilities is one of the most studied areas in education (Hudson, High, & Al Otaiba, 2007), relatively few high-quality studies have been done working with students with E/BD paired with reading difficulties. A meta-analysis of the literature by Benner, Nelson, Rolston, and Mooney (2010) indicated that effective literacy instruction can have a positive effect on reading outcomes for students with E/BD. The findings of this literature review identified three specific components that need to be addressed when conducting interventions for this population. First, a reading intervention should use a tested model grounded in theory. Secondly, research should be conducted at the secondary and tertiary levels within a multi-tiered educational delivery system. Thirdly, research should follow secondary and tertiary level requirements for direct, explicit
instruction; sequencing or scaffolding of instruction; and behavior management procedures already in use by the schools which include appropriate motivators and a high level of teacher and student interaction (Benner, Nelson, Rolston, & Mooney, 2010).

The meta-analysis by Benner et al. (2010) identified only 6 group studies (187 students) and 18 individual case studies (92 students) that met their inclusion criteria for high-quality interventions for students with E/BD and reading difficulties. Of the 6 group studies, only 2 measured for more than one of the fundamental skills identified in DIBELS (Nelson, et al. 2004; Lane, Fletcher, Carter, Dejud, & De Lorenzo, 2007). Of the individual case studies, one focused on phonological awareness (Wehby, Falk, Lane, Barton-Arwood, & Cooley, 2003) and one researched verb identification (Hawkins, 1988). Three of the case studies tested for Nonsense Word Fluency (NWF) (Barton-Arwood, Wehby, & Falk, 2005; Lane, Little, Redding-Rhodes, & Phillips, 2007; Lane, Wehby, Menzies, Gregg, Doukas, & Munton, 2002). The rest of the group and individual case studies in the meta-analysis focused their research on and tested only for overall Oral Reading Fluency (ORF) and/or comprehension.

**Group studies.** A cross-sectional study by Nelson et al. (2004) measured the level of reading performance over time and indicated that students with E/BD and reading difficulties experience lasting academic failure across all content areas. It was also found that reading abilities tended to stay the same or worsen over time. Students with externalizing behaviors were more likely than students with internalizing behaviors to have academic problems.

An intervention was conducted on phonological awareness for pre-reading kindergarten students at risk for E/BD and reading difficulties (Nelson, Brenner, &
Gonzalez, 2005) using the Stepping Stones to Literacy program. The results of this study confirmed that theory-based and research-driven interventions using explicit instruction can be effective with this population.

**Individual case studies.** Strong, Wehby, Falk and Lane (2004) examined the impact of Corrective Reading (CR) (Englemann et al. 1999) combined with repeated reading using text passages from Great Leaps Reading Stories (Mercer & Campbell, 1998). This study combined phonics instruction with repeated choral and individual reading. The results showed moderate growth in ORF during the CR intervention for all 6 students. Four of the 6 students also made gains in functional reading of grade level content. Corrective Reading is explicit, systematic, direct instruction using scripted lessons with the goal of achieving mastery. Positive reinforcement and praise are the key elements in the CR behavior management system.

A study focusing on Phonological Awareness Training for Reading (PATR) (Wehby, Lane, & Falk, 2005) measured for Letter Naming Fluency (LNF), Initial Sound Fluency (ISF), and Nonsense Word Fluency (NWF), which are important skills necessary to decode words. Some of the students made moderate improvements in NWF while others demonstrated few or no gains. Teacher perceptions, however, indicated great gains in reading as well as overall student satisfaction with the intervention.

Lingo, Slaton & Jolivette (2006) studied the impact of CR on ORF and the behavior of middle-school students. Corrective Reading proved to be an effective way to increase ORF but the increase in ORF did not result in a reduction of inappropriate behaviors. A study performed with adolescents in a juvenile detention center also used CR and found it to be an effective way to teach reading to individuals with E/BD and
reading difficulties (Allen-DeBoer, Malmgren, & Glass, 2006) but behavior was not measured.

Fuchs, Fuchs, Mathes & Simmons (1997) showed lasting improvement in ORF and NWF for students who used Peer Assisted Learning Strategies (PALS) during a teacher-led intervention. The intervention had no effect on behavior as measured by the Academic Engaged Time Test (AET) (Lane, Little, Redding-Rhodes, & Phillips, 2007).

More recent studies. A study performed by Harris, Oakes, Lane, and Rutherford (2009) examined the differences between internalizing and externalizing behaviors and response to a reading intervention. The researchers wanted to find out if there was a difference between students with internalizing behaviors and students with externalizing behaviors and their overall Response to Intervention (RTI). Eight first grade students, 6 boys and 2 girls with E/BD from a suburban school in a Southwest city, participated in the study. The students were given a supplementary reading intervention using the Sonday System (Sonday, 1997) to practice phonemic awareness and phonics and the Great Leaps program (Campbell, 1998) to practice reading fluency. The students were observed and appropriate behaviors were reinforced using the Teacher-Student Learning Game (Nelson, Benner, & Mooney, 2008). Following the intervention, all of the students were given post-tests using DIBELS to measure NWF and ORF. The results showed an increase in both ORF and NWF for all students. The researchers concluded there was no significant difference in literary skills between boys and girls or between internalizing and externalizing behaviors. Although behaviors improved during the intervention, they were not maintained when the students returned to their regular classrooms. A previous
study had found that students with externalizing behaviors are less responsive to interventions than students who have internalizing behaviors (Nelson, et al. 2004).

A study by McDaniel, Duchaine and Jolivette (2010) focused on student and teacher perceptions of the Corrective Reading (CR) program. Previous studies had already shown CR to be an effective way to teach reading to students with E/BD and reading difficulties (Lingo, Slaton, & Jolivette, 2006; Strong, Wehby, Falk, & Lane, 2004). Student perceptions were gathered through focus groups and interviews. Teacher perceptions were collected using questionnaires and interviews. Both students and teachers perceived CR as an effective way to teach reading. The teachers’ consensus was that CR is an easy program to learn and implement. Students reported that they enjoyed the intervention.

Only one study used a multisensory approach along with a phonics-based, direct instruction reading intervention. Oakes, Mathur and Lane (2010) performed a multiple baseline across groups design study to examine ORF training for students with challenging behaviors paired with reading difficulties as compared to students with reading difficulties alone. Oral Reading Fluency (ORF) was measured using DIBELS. Behaviors were scored according to the Social Skills Rating System (SSRS) (Gresham & Elliott, 1990).

In the Oakes et al. (2010) study, the primary reading instruction consisted of two components. The first component was using the Harcourt Trophies series 4 times per week for 45-minute sessions. Teachers focused on vocabulary-building, daily oral and choral reading, along with daily classroom discussion of stories to improve comprehension. The second component was whole class phonemic awareness and
phonics instruction for 4 days a week for 30 minutes each day. Phonics instruction used Fundations: Wilson Language Basics for K-3 (Wilson, 2002) which included print knowledge, alphabet awareness, phonological awareness, phonemic awareness, decoding, vocabulary and spelling. Student progress was monitored using the DIBELS benchmark assessments three times a year.

Students whose DIBELS' ORF scores did not improve or declined after the first 6 weeks were assigned to a smaller secondary reading intervention group. This group consisted of 9 students who participated in additional Fundations instruction for reading accuracy led by a reading specialist for 4 times a week for 20 minutes each session, with an additional 10 minutes of oral reading. The reading accuracy intervention lesson consisted of multisensory activities; flashcards to practice drill sounds including letters, digraphs, and other letter combinations; glued sounds; closed syllables exceptions; dictation; and Echo/Find Letters and Words (Oakes, Mathur, & Lane, 2010).

The results of this study indicated that all of the students increased in ORF. The majority of students with reading and behavior difficulties made moderate or greater increases in ORF compared with peers with reading risks alone. Students with externalizing behaviors but without attention deficits made positive improvements while students who only had attention deficits did not improve. These findings help to support Benner et al. (2010) conclusions that students with E/BD can benefit from a phonics-based, explicit reading intervention.

**Conclusion.** According to the literature, more research needs to be done at the secondary or tertiary level with students who have E/BD and reading difficulties. Corrective Reading, repeated reading, and Peer-Assisted Learning Strategies were found
to be effective methods of instruction. Research to date has focused almost entirely on and tested only for overall ORF, however. Only 6 studies specifically measured for NWF, which is one of the fundamental sub-skills necessary to achieve mastery in reading fluency. Only one study specified the use of a multisensory approach.

**Orton-Gillingham Method**

**Brief history.** Nearly 100 years ago, a neurologist named Dr. Samuel T. Orton, along with educators Anna Gillingham and Bessie Stillman, developed a teaching program now referred to as the Orton-Gillingham (OG) method. The OG method uses a multisensory approach to teach students with specific reading deficits to increase language skills.

Orton (1929) recognized that a student’s perception of written language played a significant role on a student’s ability to master reading, spelling and handwriting. Orton suggested that the answer to remediation lay in developing different, individualized instructional methods for teaching reading, spelling, and handwriting skills (Vickery, Reynolds, & Cochran, 1987).

While working in a psychiatric hospital, Dr. Orton met intelligent students who had an inability to learn basic reading and writing skills. These students often had weaknesses in auditory or visual processing of language. Orton noticed his students were unaware of the roles sounds play in words and had difficulties putting together letter combinations when creating verbal and written language. Dr. Orton referred to this learning disability as “strephosymbolia”. The word "strephosymbolia" translates into “twisted symbols” which later became known as a specific reading disability now referred to as dyslexia. Dyslexia is a specific learning disability in reading and writing
that cannot be attributed to a lack of intelligence or a physical disability such as hearing or vision (Camp & Aldridge, 2007). Orton, along with Gillingham and Stillman, proposed breaking down words into manageable parts and including a multisensory experience when teaching reading in order to increase language skills and comprehension for dyslexic students (Barton, 1998; Gillingham & Stillman, 2000).

Dr. Orton was influenced by the kinesthetic method described by Grace Fernald and Helen Keller. Orton believed that the use of the kinesthetic-tactile method along with visual and auditory techniques could help students with reading difficulties to overcome reading and writing deficits (Henry, 1998).

Orton was one of the first to advocate for the use of phonics to teach individuals with specific reading deficits. Orton believed this process of seeing; saying and writing words could help students to overcome problems of reversing images (Orton, 1925). He also believed studying phonics alone was not sufficient for students to overcome reading deficits. He proposed the notion of sound blending. Sound blending is a technique for the blending of letter sounds when teaching students the exact sequence of letters and how they appear in words, along with the correct pronunciation. Orton's new method of blending sounds had never been used before. Orton believed the process of synthesizing words and parts of words into spoken units can be helpful to increase decoding abilities for struggling readers. Many students with learning difficulties have problems associating sounds with their corresponding letters and groups of letters. Because of Orton's observations and his motivation to help students with reading deficits, he became one of the first to introduce the idea of a multisensory teaching approach to reading and writing (Henry, 1998).
**Language-based instruction.** OG would not be typically referred to as a language-based instructional program. Rather, it would be better described as an interactive approach to teaching reading, starting with the basic sounds of letters in the alphabet and slowly progressing to a more advanced phonemic awareness of the language. Although the OG teaching technique does incorporate the use of language-based materials such as age-appropriate, oral reading with a combination of sentence dictation, spelling and word recognition, the focus of the OG approach is on mastery of decoding a language one component at a time, simultaneously having the student work on reading and writing and spelling learned materials in order to achieve reading fluency.

The OG method is a goal-based, individualized, success-oriented system including positive feedback from the teacher as well as active involvement of the student in order to insure successful experiences on a daily basis. It is a code-based intervention structured around phonics to reinforce students' abilities to identify sounds and blend them into words. Students with reading difficulties tend to have poor visual memory, so the meaning emphasis approach is not an effective teaching method with this population of students (Masons, 2008).

**Multisensory instruction.** The multisensory method has been shown to engage students in their lessons and to result in more on-task behavior (Thorpe & Borden, 1985). A multisensory approach to teaching is more effective in a small group or one-to-one tutorial setting. (Oakland, Black, Stanford, Nussbaum, & Balise, 1998).

**Auditory method.** The first sensory modality is the auditory approach. The auditory approach refers to the phonological make-up of a language. The word "phonological" describes the way sounds function within a given language. Students with
reading difficulties often have deficits in their phonological decoding skills—meaning a
difficulty in transferring units of print into sounds and words (Thorpe & Borden, 1985).
Phonological” combines two Greek roots: "phone" meaning →voice or sound” and "logo"
meaning →word in speech”. All languages can be broken down into different sounds to
create words. It can be helpful for students with reading difficulties to learn proper
speech patterns because proper speech can help increase students‘ abilities to read and
write (Post & Carreker, 2002). Many students with reading difficulties may have the
ability to speak correctly but have problems decoding written language. The auditory
approach focuses on students’ abilities to identify different sounds in the spoken language
and to understand how the sounds are represented by symbols (Oakland, Black, Stanford,
Nussbaum, & Balise, 1998). While speaking, teachers should demonstrate proper
linguistic skills, such as proper pronunciation and syntax, in order to reinforce students‘
abilities to hear and say words correctly. Teachers‘ proper pronunciations of different
letter combinations can help students learn correct articulation and the orthography of a
language (Thorpe & Borden, 1985). The teacher can also use the pronunciation of Latin
roots commonly found in language to help students understand the meaning of words and
increase students‘ vocabulary.

Visual method. The second modality is visual comprehension of letters and the
combinations of letters. Orthography is a set of rules on how to correctly identify specific
symbols in the writing system of a language. “Orthography” combines two Greek roots:
"ortho" meaning →correct” and "graphy" meaning "that writes". The word →orthography”
means correctly writing a word in symbols to create language. When a student
understands writing and the way symbols are put together to form words, the result is an
increase in reading and writing ability. Without the ability to understand the symbols of a language, students may have difficulties developing automaticity in reading because of difficulties when transferring individual letters and groups of letters into patterns of sound (Post & Carreker, 2002). Learning the sounds of individual letters and letter combinations can help students recognize the sounds and to broaden vocabulary. Once a person has mastered the identification process, he/she can break down a language into smaller, more manageable parts, which can lead to reading fluency. As fluency becomes automatic, comprehension and understanding of the written word can be increased. The visual method of breaking words apart and learning different decoding techniques is part of the multisensory method. This method has been found to significantly increase students’ ability to decode words and to increase reading comprehension as compared to students in reading programs that do not use explicit instructions of breaking words into smaller parts (Gillingham & Stillman, 2000; Post & Carreker, 2002).

The visual and auditory approach can be used together as students learn to hear and recognize letters and say the corresponding sounds out loud. Teaching students with reading difficulties to identify when and how often different combinations of letters are used to produce the same sound can give the students a better understanding of the language. Such rules are taught using a multisensory method to help students compensate for their phonological and orthographic deficits (Oakland et al., 1998).

**Tactile method.** The third sensory modality is the use of tactile strategies when teaching reading skills. The tactile method is the use of hands-on techniques when teaching language skills. Students with reading difficulties often have trouble staying on-task due to frustration and boredom with reading. The tactile method can be helpful in
teaching students to stay engaged and focused on the task of reading. One method
teachers can use is to have the students use their fingers to trace letters on a page while
saying the words out loud. Learning to recognize the letters and saying them out loud can
be reinforced by the use of touch. The physical engagement of touching the graphemes
helps students stay focused and it imprints the shapes of the graphemes in their minds.
Students can also use their fingers to break words into separate parts in order to sound out
and decode words one at a time. The act of using their fingers will help the students stay
engaged while reading (Gillingham & Stillman, 2000; Masons, 2008).

**Kinesthetic method.** The fourth modality of the multisensory approach is the use
of kinesthetics when learning to read and write. Kinesthetics is the act of physically
moving one’s body in space while performing a task. One way kinesthetics can be used
for teaching students is to have the student use his/her finger to write letters in the air
while saying the corresponding sounds out loud. Another way the teacher can incorporate
kinesthetics is to use three-dimensional magnetic letters to teach the letters and their
associated sounds. Using flashcards is another kinesthetic method. The process of writing
out flashcards is an active way for students to practice forming letters while saying them
out loud. As the student is physically flipping through each card and saying the sounds
out loud, he/she is using all of the multisensory methods (i.e., auditory, visual, tactile, and
kinesthetic) while remaining engaged.

When teaching students with reading difficulties it is important to use a
multisensory approach so the students can perceive language through different sensory
modalities. One suggestion for using a multisensory approach in a regular classroom is
for the instructor to guide students through the creation of flash cards by (a) writing the
information on the board (i.e., visual), (b) explaining the concept or reading the information out loud (i.e., auditory), and (c) providing time for the students to write the information on a flash card (i.e., tactile/kinesthetic). In this way, the information is being presented through three different sensory modalities. Using this method in the regular classroom setting could be helpful to teach many subjects in order to engage the class and increase their learning of the material.

Research has found the use of a multisensory approach to teaching reading and writing can help students with and without reading difficulties to improve language skills and comprehension (Thorpe & Borden, 1985). As a result, this same approach could be helpful in order to keep all students engaged during class time as well as having an effective study tool (the flashcards) for future reference. The multisensory approach does not correct the problem of reading difficulties. However, it gives students with reading difficulties additional tools to help them compensate for language deficits.

**Structured, sequential and cumulative instruction.** The OG approach is structured around an individual’s ability to decode the language. Orton-Gillingham instruction adds new material sequentially as a student learns new phonics skills and rules, but the instructor only moves on to new materials when a student achieves approximately 90% accuracy at the current level (Masons, 2008).

**Cognitive instruction.** The OG approach uses direct instruction in a systematic way to teach a student the skills needed to become an effective reader. The teacher starts with the most basic skills of a language, then progressing at the student’s rate to more complex skills. The OG approach helps by teaching specific trends and generalizations found in a language. During each lesson the teacher introduces specific rules that can be
applied in a wide variety of situations. Each new skill builds on the previous skill so the student can achieve success throughout the lessons to ensure he/she will not become frustrated or discouraged during the learning process. Once a student has achieved mastery of a skill, the teacher will then introduce a new skill. Using this systematic, rule-based approach helps a student to experience success while gaining an understanding of the structure of a language (Masons, 2008).

The students are first introduced the different sounds of a language. The teacher then introduces each letter that corresponds with the sound. Students then learn to combine sounds of letters together to form words. As a student progresses, he/she will be taught the definition of syllables. The student progresses and he/she learns how to break words into smaller parts known as syllables. The student then learns each syllable type along with its characteristics. The OG approach also uses discovery learning when teaching new skills for the first time. This helps the student to take ownership of and remember what he/she has learned. Discovery learning/Guided Practice is a process of asking probing questions to help students come to their own correct conclusions rather than providing the answers for the student (Masons, 2008).

**Flexible instruction.** The OG approach is an individualized, systematic way of teaching. Lessons are designed to help a student to overcome his/her specific problem areas. As students progress, the lessons will incorporate the use of repetition and systematic instruction to help each student obtain mastery before moving on to the next skill level. The OG approach recognizes that all students learn differently and at different rates, and may have strengths in a particular area with weaknesses in others. When a student shows particular weaknesses in an area, the instructor attempts to present the
material in a variety of different media using a multisensory approach which can help a student to achieve mastery of a skill through the use of different senses such as auditory, visual, tactile, and kinesthetic. This systematic instruction along with continuous review can help to reinforce learning materials while introducing new skills. The OG approach integrates maintenance by continuously reviewing learned materials while introducing new rules and skills.

**Emotionally sound instruction.** While teaching students using the OG approach, it is important to use continuous, positive reinforcement throughout each lesson. Because many students with reading difficulties have experienced a great deal of failure, positive reinforcement helps the student to realize that he/she can succeed. This success-oriented approach helps to build confidence and self-esteem (Masons, 2008).

The multisensory approach helps to get the student involved in the lesson. A high level of student engagement reinforces learning. Working with an empathetic tutor one-to-one motivates the student and gives the student a feeling of self-worth which also contributes to learning. As the student continues through the program, the number of phoneme flashcards will increase which will give the student tangible evidence of improvement (Gillingham & Stillman, 2000).

**Orton-Gillingham Based Programs**

The following three teaching methods have all been derived from and structured around Samuel T. Orton's theory of multisensory learning. The underlying instructional principles are consistent with the original OG methodology although the targeted age group, instructional setting, materials, or other differences may exist,”
(p. 172) (Richey & Goeke, 2006). They are The Slingerland® Approach, Alphabetic Phonics and The Wilson Reading System®.

**The Slingerland Approach.** The Slingerland® Approach is a classroom adaptation of OG’s systematic way of teaching students to read. This method has been found to be effective in meeting the instructional needs for students in general education as well as those who experience reading difficulties. The Slingerland® Approach incorporates whole word and sentence dictation while teaching the reading process. This process of teaching language simultaneously exposes students to the orthography of a language in written and oral forms. In this method, all learning is understood to occur through a simultaneous interaction of auditory, visual and kinesthetic modes. This approach helps to strengthen the inter-sensory channels of learning so that a student’s more developed skills will help to reinforce his/her less developed skills. The students are also exposed and taught the rules of sentence structure, capitalization and punctuation. The Slingerland® Approach employs its own screening tests for students. The tests are designed to replicate and evaluate skills the student needs in his/her everyday classroom, such as copying from the board, auditory memory, visual distinction, and spelling. Although Slingerland® uses the same systematic, multisensory teaching style as OG, it has a slightly different application process (Slingerland Institute for Literacy).

**Alphabetic Phonics.** Alphabetic Phonics® (AP) is a literacy program based on the research of Aylett R. Cox. This method is a systematic, multisensory curriculum derived from the OG approach. It is used for individual and small group instruction as well as basic language instruction in the classroom. The AP curriculum was designed around Anna Gillingham’s and Bessie Stillman's theory of teaching reading, spelling, and
cursive handwriting as a way to trigger as many sensory modalities as possible. AP was
developed by Cox and the staff of the Texas Scottish Rite Hospital Language Laboratory
in Dallas, Texas (Vickery, Reynolds, & Cochran, 1987).

Cox developed another systematic way of introducing language learning by
breaking the alphabet into small, manageable parts. Alphabetic Phonics® teaches reading,
handwriting, spelling, verbal and written expression and comprehension by engaging the
student visually, kinesthetically, and through the use of auditory modality. The student is
taught by the use of phonics instruction and the over-learning of material through
intensive practice and review (Cox, 1992).

**Wilson Reading System.** The Wilson Reading System”® (WRS) is divided into
three different instructional programs, copy written as –Fundations,”® –Just Words,”® and
The Wilson Reading System”®.

The –Fundations”® program is designed for students in grades K-3 as a
preventative measure in a whole classroom environment; for student readers in the 30th
percentile; and as an intensive intervention for students with language-based learning
disabilities. Multisensory techniques are implemented throughout the program to increase
the student’s awareness of word structure in order to increase decoding and automaticity.

The –Just Words”® program is designed as a supplemental phonemic awareness
and phonics program for students in grades 4-adult who do not have a diagnosed
language disability.

The Wilson Reading System® (WRS) is designed for students with dyslexia or
language-based learning disabilities from grade 2-adult. The WRS systematically works
through the Five Big Ideas of reading instruction as identified by the National Reading Panel (U. S. Department of Health and Human Services, 2000).

Wilson Fluency®/Basic is designed for students who have difficulties with reading fluency. The skills taught involve high-frequency words, along with high-frequency sight words and specific word patterns. The focus is on improving a student’s accuracy, automaticity and prosody while reading (Wilson Language Training, 2009).

**Research Support for Orton-Gillingham Reading Instruction**

**Research with typical learners.** A study involving the use of the OG approach with typical learners was performed by Vicery, Reynolds and Cochran (1987) at an independent elementary school district in Greenville, Texas, along with the help of researchers from the University of Texas and the University of Texas, San Antonio. This four year study was administered using an OG-based curriculum. All students in kindergarten through sixth grade in the lowest reading classes participated in the study using Alphabetic Phonics® (AP).

The AP approach was first used in a Texas school where it was found to have a positive effect on the whole classroom. The original AP intervention was modified and called The Multisensory Teaching Approach for Reading, Spelling, and Handwriting (MTARSH). The MTARSH study used the California Achievement Test (CAT) to determine each student’s baseline score. After the 4 year study, the baseline scores of the students on the CAT from two years prior to the intervention were compared. The results showed a significant improvement for students with specific reading difficulties. Students who were not diagnosed with specific reading difficulties also showed improvement.
These results indicate that an AP approach to teaching reading can be helpful with all students (Vickery, Reynolds, & Cochran, 1987).

**Research with at-risk learners.** Stoner (1991) conducted a study in the upper-midwest using first, second, and third grade students from a school district. All of the students in this study were predicted to be at-risk and were assigned to the lowest reading group. The intervention group was given an OG-based multisensory reading program called Project Read. A control group was made up of other at-risk first, second, and third graders being taught by the traditional basal reading technique. The results were an increase in word study skills, word reading, comprehension and fluency for the experimental group. The increase in word study skills was expected, but the increase beyond the decoding level was considered a particularly important finding which researchers hypothesized might mean that the intervention affected all areas as measured by the 1982 version of the Stanford Achievement Test. Other explanations for the overall increase in performance may be attributed to an increase in teacher training and teacher-student interaction (Stoner, 1991).

Hook (2001) performed a two-year study in the Boston area testing the effectiveness of Fast ForWord instruction compared to students who received an OG-based intervention. In this study, there were three groups of students from ages 7 to 12 years old with similar IQ, social-economic status (SES) and reading difficulties: the Fast ForWord (FFW) group, the OG group and a longitudinal control group (LC). Students were included in the study if they scored below the 16th percentile on the word attack and/or word identification subtests or had a verbal IQ of at least one standard deviation above their word attack and/or word identification score. Students with history of
emotional disturbance were excluded from the study. The FFW instruction was a computer-based program. The OG instruction was an individualized, one-to-one program.

The students in the FFW and the OG groups did not show significant gains in word identification. However, both groups showed a similar increase in phonemic awareness. The students taught using an OG program showed significant gains in decoding skills and greater gains than the FFW group in word attack (Hook, Macaruso, & Jones, 2001).

In 1997, a collaboration of authors from the University of Houston, Arizona State and the University of Texas, Houston Medical School conducted a study in thirteen schools in an urban school district in the southwestern United States (Foorman, et al., 1997). Three different types of instruction were administered: (a) synthetic phonics, (b) analytic phonics, and (c) sight word programs. All of the groups were comprised of second and third grade students with reading difficulties.

The synthetic phonics group used the OG-based approach. Although the study was confounded with a variety of different demographic variables, it did show that the synthetic phonics group improved and outperformed the sight word group and the analytical phonics group in phonological processing, but there were no significant gains in word reading (Foorman, et al., 1997).

**Social validity.** Social validity measures the acceptability of an intervention and its procedures. Montrose Wolf (1978) proposed that consumers, parents and guardians of dependent people should understand and value the appropriateness of the procedures, the social importance of the study, and the end goals. The main purpose of social validity assessments is to help select and guide appropriate implementations for the changing of
skills or behaviors. The most important method of measuring social validity is to gather the input of the consumers themselves, as well as other individuals who closely associate with the consumers (e.g., family members, therapists, teachers, and other members of the community). The information gathered by social validity questionnaires is considered to be a collection of personal opinions and not evidence of the success or failure of the intervention itself. The literature provides support for the use of an OG-based approach for teaching literacy (Richey & Goeke, 2006).

**Summary of Literature Review**

This literature review presented the different types of reading interventions used for students with E/BD paired with reading difficulties. Much of the literature indicates there are a limited number of high-quality research studies being done to help increase the literacy skills of students with E/BD. Some of the common themes found throughout the literature point out the best way to teach this population of students. Reading instruction should be grounded in theory and incorporate the use of direct instruction in secondary or tertiary tier levels of teaching. The reading interventions should include individualized instruction, with a high level of involvement paired with a well-defined behavior management program. Although many of the studies found an increase in reading abilities for students with E/BD paired with reading difficulties, few reported any changes in student behaviors following the reading interventions (Benner, et. al., 2010).

The Orton-Gillingham method of teaching reading has been found to be successful with students with reading difficulties alone and many specialized reading programs have stemmed from this approach. However, no studies specifically researched
the use of the OG approach with E/BD students with reading difficulties. The social validity of the OG approach has already been established.

The researcher was interested in answering the following research questions regarding the effectiveness of an OG-based reading intervention for students with E/BD and reading difficulties:

**Research Questions**

1. What effects will an Orton-Gillingham based intervention program have on the decoding skills of students identified as E/BD and reading difficulties?

2. What, if any, is the correlation between tutees’ classroom behavior during the reading intervention compared to the overall success of the intervention?

3. Do students with E/BD enjoy the Orton-Gillingham-based intervention for reading instruction?

4. What are the classroom teachers’ impressions of the effectiveness of the Orton-Gillingham-based reading instruction on students’ academic learning?

5. What are the classroom teachers’ impressions of the effectiveness of the Orton-Gillingham-based reading instruction on students’ behavior?
Chapter Three

Method

Introduction

The following chapter gives a brief description of the participants, the setting and the methodology used in the study. Background information about the researcher is given. The independent and dependent variables are identified and discussed. Social validity and treatment fidelity issues are addressed. A description of the Orton-Gillingham method for teaching reading is explained. Finally, examples of the activities that make up the treatment package are provided.

Methodology and Approach

In order to answer the research questions, it was necessary to use both quantitative and qualitative data collection. This study was a single-subject, multiple-baseline across skill sets design (Cooper, Heron, & Heward, 2007). The qualitative aspect of the research was a questionnaire regarding teachers’ and students’ perceptions of the effectiveness of the independent variable. Qualitative studies are descriptive and exploratory inquiries which are useful to measure “social phenomena from the perspective of those involved” (Glesne, 2006).

The researcher collected data points to measure the effectiveness of an OG-based reading intervention on reading skills. The researcher was limited to a small, specialized subject population. However, quantifying all of the variables which might affect the student’s behavior was nearly impossible. Students were identified as E/BD for a variety of reasons. Some variables may have included family background of mental illness and conduct disorder, low socio-economic status (SES), history of mental and physical abuse,
or an unstable home life involving alcohol and/or drug abuse. While it was not the focus of the study to assess each student’s entire family history or current situation for all variables, the researcher was necessarily limited to a brief qualitative assessment of how each student self-reported regarding the way he was feeling prior to the tutoring intervention. This qualitative interview at the start of each lesson was intended to help the researcher identify trends that might predict behavior and impact performance.

**Participants**

Four students from an urban school for students with E/BD and reading difficulties were chosen by their teachers to participate in the study. Each student was screened by the Head Teacher according to the following criteria. All of the students in the study had been diagnosed as E/BD paired with a deficit in reading. Additional criteria included that the students were not new to the Center and were not highly-oppositional or highly-aggressive. All of the participants in the study were Toledo Public School (TPS) students with Individual Education Plans (IEP) who were out-patients in the partial hospitalization program at an urban school for students with E/BD. (See Table 1 for Individual Student Characteristics).

Student A’s teacher reported that Student A often becomes frustrated with school work, lashes-out at other students in his classroom, starts arguments and fights. When in conflict, Student A often yells or shows aggression towards teachers or other antagonists. When this happens, Student A often walks out of the classroom frustrated, briskly walks through the halls ignoring teachers and staff.

Student B’s teacher reported that Student B was often teased and antagonized by his classmates. As a result, Student B usually reacts by yelling and threatening the other
students. He is constantly anxious about matters beyond his control. He is on medication for anxiety and depression. Student B often acts withdrawn, sad or lethargic. Student B is on the autism spectrum and has difficulties controlling his behaviors. When Student B becomes frustrated with school work, he often withdraws by sleeping with his head on the table or breaking down in tears. Student B displays drastic mood swings from laughing and joking around with his classmates or staff to fits of rage or sadness.

Student C’s teacher reported that Student C has a hard time staying on task and many times leaves his regular classroom, doing handstands up against the wall or rolling around on the floor. Student C is often disruptive in a playful manner, and, when confronted with his disruptive behavior, resorts to anger, breaking pencils and throwing things across the room. Student C has a diagnosis of E/BD as well as attention deficit hyperactivity disorder (ADHD).

Student D displays a wide variety of disruptive behaviors, frequently joking around with the teachers and staff members until they ask him to stop—at which point he reacts in explosive behaviors, throwing desks and chairs across the room, kicking trash cans and destroying school supplies. Student D was escorted off the school premises by police officers for throwing rocks at cars, threatening teachers, and starting fights. When Student D gets mad he starts breathing heavily through his nose, sticking his chest out, clenching his fists, scowling at the staff members, and threatening them with violence. He tries to intimidate the teachers and other staff members. When Student D gets mad, he often walks out of the classroom yelling profanity.
The students ranged in age from 10-14 with a mean age of 11.75 years, and were enrolled in grades 4-8. Three of the students were African-American and one of the students was Asian-American. All of the students had a diagnosis of E/BD. One student had an additional diagnosis of autism and another was identified as having Attention Deficit/Hyperactivity Disorder (AD/HD). All 4 of the students tested in the “borderline” range with a mean Full Scale Intelligence Quotient (FSIQ) of 71.25 and scored below grade level in reading achievement.

All of the students’ parents/guardians were given a cover letter briefly describing the study and a consent form prior to conducting the research (See Appendix A and B). The parents/guardians had the right to withdraw their children from the study at any time. The students were also given a consent form to sign agreeing to participate in the study (See Appendix B). The procedures were reviewed and approved by the Human Subjects Review Board at the University of Toledo prior to the implementation of the intervention. All of the data collected was interpreted and made available to the students’ parents, teachers and other school administrators at an urban school for students with E/BD.

Table 1
Participants Characteristics

<table>
<thead>
<tr>
<th>Age</th>
<th>Grade</th>
<th>Ethnicity</th>
<th>Disability</th>
<th>FSIQ+</th>
<th>Reading Achievement*</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>4</td>
<td>African-American</td>
<td>E/BD</td>
<td>72 - Borderline</td>
<td>Below grade level</td>
</tr>
<tr>
<td>14</td>
<td>8</td>
<td>Asian-American</td>
<td>E/BD/Autism</td>
<td>68 - Borderline</td>
<td>Below grade level</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>African-American</td>
<td>E/BD/ADHD</td>
<td>74 - Borderline</td>
<td>Below grade level</td>
</tr>
<tr>
<td>12</td>
<td>6</td>
<td>African-American</td>
<td>E/BD</td>
<td>71 - Borderline</td>
<td>Below grade level</td>
</tr>
</tbody>
</table>

+ Full Scale Intelligence Quotient scores from the Wechsler Intelligence Scale for Children (WISC-IV).
* As identified in each student’s Evaluation Team Report (ETR).
Setting

The researcher conducted the study at an urban school for students with E/BD. The setting was a public school specializing in working with students identified as E/BD. The urban school for students with E/BD is a Partial Hospitalization Treatment Program for students from Toledo Public Schools (TPS) who cannot maintain appropriate behaviors in a regular classroom setting.

Students are assigned to the specialized school by a recommendation from the Special Education teacher at the students' home school. The students at came from all of the surrounding schools, as well as other public schools in the area. Each student referred to the urban school was given a battery of tests to identify the student's strengths and weaknesses.

The specialized school serves students ranging from Kindergarten through 12th grade. Each classroom is limited to 8 students. This has been found to be the optimal number when working with students with E/BD (Abrams, 2005). For students' and staff safety, and for reasons of liability, at least two staff members are required to be in a classroom at all times. Staff members include teachers, paraprofessional employees, social workers, and mental health providers.

The researcher worked with each student in an activity room designated for recreation and other reward activities. The room contained a basketball hoop, air-hockey table, pinball machine, television with a Wii gaming system, a freestanding chalkboard, and a large table in the middle of the room where the intervention took place. The student and researcher sat next to each other at the table. The area was quiet but there were, at
times, interruptions by teachers, students, staff members and public address announcements (over the intercom).

The researcher went to the school four days a week, Monday through Thursday. He created a schedule to meet with each student twice per week for forty-five minutes per session. The first session began at 10:30 AM and the second session began at 12:30 PM (See Appendix C).

**Research Design**

The effect of the OG-based reading instruction was tested with students who had reading difficulties by using a multiple-baseline, single-subject across skills sets design. A multiple-baseline across skills sets design is an effective tool to analyze the impact of the independent variable, plotting data on a graph to measure each student's individual growth as compared to his own baseline performance. Each student's findings were individually graphed and interpreted using level and trend analysis (Cooper, Heron, & Heward, 2007).

The experimental logic was to analyze each student’s response to the intervention by measuring reading achievements in baseline, intervention, and maintenance phases. Additionally, each student was given pre-test and post-test measures using two different versions of the first grade DIBELS test along with random probe tests in order to identify which set of skills would be administered first. The student's data was then graphed individually and compared with his own performance serving as his own control (Horner, Carr, Halle, McGee, Odom, & Wolery, 2005).
Data Collection and Analysis

Quantitative. The quantitative aspect of the research involved the independent variable being systematically implemented to improve the students’ reading skills, the dependent variable. This data was collected on daily 10-point Probes of words read correctly to measure the effectiveness of the independent variable (See Appendix D). In addition to daily measures of reading skills, the research also tracked each student’s behavior by assigning a numeric value reflective of his overall behavior during each instructional session. The researcher kept track of each student’s behavior during the sessions using the behavior tracking system developed by the school. Monitoring the students’ behavior helped the researcher to determine what type of reward the student earned during the session, and also to see if there was a correlation between students’ behavior and performance. This data was recorded and calculated on a Student Behavior Record Sheet (See Appendix E) and a Daily Point Accumulation Record (See Appendix F).

Definition and measure of reading. Changes in acquisition of reading skills were the evidence of the effectiveness of the instructional program. The effects on reading skills were measured quantitatively. Reading skills are sequenced in the OG-based program. Within the sequence, skills are clustered based on similarities. For the purpose of this study, the identified sequence used for beginning readers is below (See Table 2). The skill sets were created based on the Scope and Sequence of reading skills found in The Gillingham Manual (Gillingham & Stillman, 2000).
Table 2  
*Sequence and clusters of beginning reading skills*

<table>
<thead>
<tr>
<th>Level</th>
<th>Category</th>
<th>Specific Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set 1</td>
<td>Consonants (one sound) &amp; vowels (short)</td>
<td>m, f, a, t, b, i, h, j, k, p,</td>
</tr>
<tr>
<td>Set 2</td>
<td>Consonants (one sound) &amp; vowels (short)</td>
<td>r, l, n, o, e, u, d, c*, g*, s* (*common sound)</td>
</tr>
<tr>
<td>Set 3</td>
<td>Consonants (less useful) &amp; Digraphs</td>
<td>v, w, y, z, x, th*, ch*, sh, wh (*common sound)</td>
</tr>
<tr>
<td>Set 4</td>
<td>Consonant blends (final)</td>
<td>-ft, -st, -lt, -pt, -ct, -xt, -mp</td>
</tr>
<tr>
<td>Set 5</td>
<td>Consonant blends (final)</td>
<td>-lp, -lf, -lk, -nt, -nd, -sk, -sp</td>
</tr>
<tr>
<td>Set 6</td>
<td>Consonant blends (initial)</td>
<td>l blend, s blends, r blends, w blends</td>
</tr>
<tr>
<td>Set 7</td>
<td>Vowels (long)</td>
<td>VCe rule (a-e, e-e, i-e, o-e, u-e, y-e)</td>
</tr>
<tr>
<td>Set 8</td>
<td>Misc phonographs</td>
<td>y as vowel, ph, qu, ck soft c &amp; g (u = /ew/, and s = /z/)</td>
</tr>
<tr>
<td>Set 9</td>
<td>Vowel diagraphs (long)</td>
<td>ai, ay, ee, ea, oa, ow, oe</td>
</tr>
<tr>
<td>Set 10</td>
<td>Exception to closed syllable</td>
<td>-ild, -ind, -old, -ost,</td>
</tr>
<tr>
<td>Set 11</td>
<td>R controlled syllable</td>
<td>-or, -ar, -er, -ir, -ur,</td>
</tr>
<tr>
<td>Set 12</td>
<td>Suffix</td>
<td>-ed (/ed/, /t/, /d/), -ing, -s, -tion, -sion</td>
</tr>
<tr>
<td>Set 13</td>
<td>Vowel Diagraph Different</td>
<td>oi, ou, ow, oo, ew, au, aw</td>
</tr>
<tr>
<td>Set 14</td>
<td>R controlled –e</td>
<td>-are, -ere, -ire, -ore, -ure</td>
</tr>
</tbody>
</table>

For the pre-test assessment of the students’ reading ability, each student was given a screening test using the Dynamic Indicator of Basic Early Literacy Skills (DIBELS) prior to the intervention. The researcher chose the DIBELS because it is a relatively quick and inexpensive assessment of students’ reading abilities. The DIBELS test was initially developed at the University of Minnesota and studies at the University...
of Oregon found DIBELS to be a valid indicator of early literacy and predictive of future difficulties in reading (University of Oregon Center on Teaching and Learning, 2010). The results of the students’ DIBELS tests helped the researcher to identify which skill set (See Table 2) became the starting point of the intervention phase for each student. The DIBELS score served as a pre-test screening score of the student’s Letter Naming Fluency (LNF), Nonsense Word Fluency (NWF), Oral Reading Fluency (ORF), and Phonemic Sound Fluency (PSF).

Once the appropriate skill set was identified, the researcher administered three baseline probes to confirm the accuracy of the student’s performance on the DIBELS test. For example, if the student tested into the third skill set, the student was given three 10-point Probes using words from Skill Set 3 to confirm that the student was starting in the correct skill set.

At the end of each lesson, the student was given a 10-point Probe to measure the number of words read correctly in order to check whether the intervention had improved the student’s performance on the specific skills for the current set. The probes consisted of ten words formed from the letters and letter combinations introduced in the current skill set (and skills mastered from previous sets). For example, for Set 1 skills, the student was asked to read words such as *mat, it, bit, hip, bat,* and *tap.* This daily monitoring was graphed. Each set of skills constituted of an individual skill sets plotted on the multiple-baseline graph. Mastery of each set of skills was defined as the student responding with at least 9 out of 10 words read correctly for three consecutive sessions. Prior to instruction in the next skill set, 3 baseline probes were given. Once mastery of a set was reached and
the 3 new baseline probes had been given, the instruction moved to the next set in the sequence.

As a student progressed through each set of skills, previous skills were reviewed during the oral reading and the maintenance probes. For example, if the student was being instructed in Set 5, the skills from previously mastered sets (e.g., Set 4) continued to be reviewed. Words from previously-mastered sets were incorporated into the students’ oral reading portion of the lesson. Throughout the intervention, students were given random probes from previous lessons which served as Maintenance Probes. The Maintenance Probes helped the researcher to assure that the student was retaining previously mastered skills.

For the post-test assessment of the students’ reading ability, each student was given another version of the first grade DIBELS test. Each student’s post-test results were compared with his own pre-test results to measure the effects of the independent variable.

**Definition and Measure of Behavior**

The researcher determined daily rewards for compliant behavior based upon the school’s point system (See Table 3). Following each lesson, daily point rewards were allocated to the students and documented on the Student Behavior Record Sheet (See Appendix E), subject to the researcher’s discretion. Behavior points were given for each of the 6 sections of the intervention (Visual, Auditory, Blending, Lesson, Oral Reading and a 10-point Probe). A student could earn 3 points in each section with an additional 2 points for the 10-point Probe for a maximum possible total of 20-points. The researcher then looked at the overall score and provided rewards in order to celebrate high scores
and end the lesson on a positive note. Rewards were chosen by the student out of 3
treasure chests located in the Head Teacher’s office.

Table 3:
Reward Allocation

<table>
<thead>
<tr>
<th>Point Scoring</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Respecting all classroom expectations</td>
</tr>
<tr>
<td>2</td>
<td>Good effort/some problems</td>
</tr>
<tr>
<td>1</td>
<td>Disruptive Behavior</td>
</tr>
<tr>
<td>0</td>
<td>Major Problems</td>
</tr>
</tbody>
</table>

In addition to daily rewards, points for compliant behavior were accumulated until
the student achieved a total of 80 points (See Appendix F). The reward for achieving 80
points was a $5.00 gift card for McDonalds or an action figure or toy of the student’s own
choosing. During or after a session, students were also rewarded, at the researcher’s
discretion on how well the student participated during each of the drills, with activities
such as air hockey, pinball, basketball, or playing with the Wii system.

The researcher monitored behaviors according to the urban school’s Behavior
Scale based on performance and number of daily behavior points. The researcher’s
operational definitions are outlined in Appendix G.

Social Validity. In addition to the multiple-baseline across skill sets design,
qualitative data were gathered following the intervention. The researcher was interested
in discovering if an OG-based method of teaching reading resulted in behavioral and
academic changes in the students as perceived by their teachers. At the end of the study,
teachers and students were given a follow-up questionnaire, or exit survey, to measure
their overall satisfaction with the intervention. The questionnaire required teachers to
note if they had witnessed any improvement in the students’ classroom performance
and/or behaviors (See Appendix H). The students’ questionnaire inquired about student
satisfaction with the intervention and whether the students believed they had benefitted from the independent variable (See Appendix I).

The qualitative aspect of the study is in the research design category of realist ethnography, although the observations of the culture-sharing group were not extensive. The culture-sharing group was students identified as E/BD with difficulties in reading. The researcher was a participant-observer of behavior during the reading lessons (Creswell, 2007).

Prior to each lesson, the researcher collected ethnographic data from the student using questions to assess the student’s mood and overall sense of well-being on that particular day. This informal interview was intended to note circumstances that might affect the student’s daily performance.

Following each lesson, the researcher recorded a descriptive, condensed account of the student’s academic performance and behavior during the lesson. These descriptive, condensed Field Notes, as defined by James Spradley (1980), included an overview of the lesson, quotes from the student, and high or low points while administering the independent variable (Spradley, 1980). The purpose of the researcher making Field Notes at the end of each lesson was to be able to design the student’s next lesson and to focus on the student’s specific difficulties.

The researcher understood that all the recorded data was perceived and described through his own subjective lenses. According to Glesne (2007), “Subjectivity, once recognized, can be monitored for more trustworthy research and subjectivity, in itself, can contribute to research” (p. 119). The researcher disclosed his personal biases in the Researcher description in this chapter (Glesne, 2006).
The researcher was a doctoral candidate in the field of Curriculum and Instruction, Special Education, at the University of Toledo who designed a study working with students identified as having E/BD with difficulties in reading. During his doctoral studies, the researcher became a certified OG reading instructor through the 32° Masonic Learning Center.

The researcher received his undergraduate degree in Psychology from Wright State University in Dayton, Ohio, where he began working with juvenile delinquents as part of his curriculum. He then received a master's degree in Education at Wright State University. As a graduate student, he volunteered at the Greene County Juvenile Detention Center. While working with the inmates there, the researcher noticed a trend in reading difficulties paired with emotional and behavioral problems. He became interested in the field of literacy and wanted to work on developing a curriculum to help individuals with behavior and emotional problems learn to read.

Prior to his current enrollment in the doctoral program of Curriculum and Instruction at the University of Toledo, the researcher was enrolled in the Severe Behavior Spectrum (SBS) doctoral program. As part of the SBS curriculum, the researcher worked as a tutor in the Court Academy program at the Lucas County Juvenile Detention Center.

The researcher studied both qualitative and quantitative research methods during his undergraduate and master's programs. While in Dayton, Ohio, the researcher completed Quantitative Methods I. At the University of Toledo, he completed Quantitative Methods II in the fall of 2006. The researcher also studied Research Design
8320 in the spring of 2007 and Qualitative Research Design I 7330 in the summer of 2007.

The researcher primarily used quantitative methods when collecting data on the student’s reading performance, supplemented by qualitative research for the social validity aspects of the study. It is important for the researcher to be aware of his own biases and to point them out to his readers so that he, and they, are careful not to draw conclusions based upon his own expectations of the intervention results (Glesne, 2006). One of the researcher’s biases is his belief that the OG method of teaching is an appropriate way to help students with reading difficulties to improve their reading skills because he has experienced success tutoring students using this method. Also, the researcher had personal success when he attended a preparatory school for dyslexic boys, The Gow School in South Wales, NY, where the reading curriculum, known as Reconstructive Language (RL) is taught. RL is based on the OG method. The researcher believes he is empathetic to students with reading difficulties and well-positioned to do this research because of his own personal experience of having dyslexia. According to Eliphas Levi, A good teacher must be able to put himself in the place of those who find learning hard (Levi, 2010).

Another researcher bias is the belief that students with reading difficulties are not getting the correct instruction in school, which often leads to academic failure. Continuously failing and struggling in school frustrates students who then may engage in negative behaviors. If students receive effective reading instruction and achieve success in reading, the researcher believes negative behaviors will be reduced. In other words, the researcher expected and was especially attentive to positive behavior change. The
researcher was aware of his personal biases and recorded all of the lessons for review by an Independent Observer (IO) to ensure that he collected and interpreted valid data.

The researcher spent two weeks observing and spending time with the students at the specialized school prior to administering the intervention in order for the students and the teachers to get used to having him around. His intention was to give the students a chance to get over their initial questions and curiosities before starting one-to-one tutoring with him. The researcher also wanted to familiarize himself with the behavior management strategy already in place at the specialized school. This gave the researcher a chance to get to know the teachers and learn about the students. The researcher is in a wheelchair and wanted the students to become accustomed to being around a person with a physical disability so that they would not waste tutoring time asking about his disability or wheelchair.

**Definition of Independent Variable**

An independent variable is the component of the experiment being manipulated by the researcher during an intervention or treatment. The researcher attempted to control the independent variable as much as possible (Cooper, Heron, & Heward, 2007). In this study, the independent variable was the use of an OG-based reading instruction. The Orton-Gillingham-based instruction consisted of a multisensory approach to teaching phonics. The dependent variable was the student’s reading ability.

The intervention was conducted in the activity room of the specialized school in order to reduce the level of distraction. The researcher provided instruction and positive feedback for each of the students in a one-to-one setting. Each lesson used explicit instruction focusing on the student’s targeted skill set. The intervention was implemented
using a multisensory teaching technique structured around an Orton-Gillingham reading program (Gillingham & Stillman, 2000; Masons, 2008).

Specifically, the instructional package consisted of a series of activities: visual drill, auditory drill, blending drill, a review or lesson introducing a new skill, and oral reading. Descriptions of each of these activities can be found in the Procedures section in this chapter.

Each student was given an individualized OG-based tutoring program designed to meet his reading need, or targeted deficit. The researcher was scheduled to work with each student two or more times a week for approximately 45 minutes per session. Following each lesson, a 10-point Probe of words read correctly provided a direct daily measure of the student’s targeted readings skills.

**Interobserver Reliability/Treatment Fidelity**

To insure treatment integrity, all of the lessons were recorded on a digital voice recorder. Lessons were randomly chosen by the researcher for the Independent Observer (IO) to review (Cooper, Heron, & Heward, 2007). The process for selecting the lessons for the IO to review was done by putting all of the students’ names on small pieces of folded, equally-sized pieces of paper. The researcher blindly chose one lesson for one of the students per week for the IO to score. The IO was a graduate assistant in the Special Education department at the University of Toledo. The researcher trained the IO on proper scoring of the Procedural Checklist (See Appendix J). The Independent Observer scored 19% of the total number of lessons.

The Procedural Checklist contained a total of 29 steps that the researcher was to cover during each lesson. The total number of steps completed in each lesson was divided
by the total number of steps in the Procedural Checklist and then multiplied by 100 to ascertain the percentage of agreement between the IO and the researcher. The IO verified the researcher’s count of the number of steps completed (Cooper, Heron, & Heward, 2007).

Interobserver Reliability data was collected for rate of correct responses for the daily probes. The accuracy percentage for the point-by-point comparison of correct and incorrect responses during the daily 10-point Probes was calculated using an adapted formula for calculating agreement scores for permanent products. The number of agreements divided by the total of agreements and disagreements, multiplied by 100 equals the percentage of agreement (Cooper, Heron, & Heward, 2007). The IO used the audio recordings to insure the researcher accurately scored the students‘ responses.

Teacher and student questionnaires were used to measure social validity. The teacher questionnaires were on a 5 point Likert scale with 1 being strongly disagree, and 5, being strongly agree. The questionnaire was to assess the teacher’s opinion on the effects of an OG based reading intervention on the students’ academic performance and reading abilities and, if the teachers noticed any changes in the students behaviors such questions included; The student’s academic skills improved after the intervention.; The student’s behavior improved after working with the researcher. etc. (See appendix H)

The student questionnaire gathered information about the students‘ perceptions of the intervention and whether the student felt it had helped his reading. All of the student questionnaire were audio recorded and the students were asked to answer yes no or stayed the same the questions included : I enjoyed working with the researcher., This was
a fun way for me to practice my reading skills. I believe working with the researcher was a positive experience. etc. (See appendix I)

Materials

The materials used were grapheme flashcards, 3” by 5” Probe cards, chalk board, dry erase board, digital recorder, sand tray, foam letters, pencil, paper and appropriate reading materials for each student relative to his skill level. Grapheme flashcards were white, 3” by 4”, heavy-stock paper cards with printed lowercase letters in black. The dry erase board had a white 8” by 11” surface. The sand tray was a 9” by 13” cafeteria tray ½ inch deep, filled with sand.

Procedures: Reading Skills

Orton-Gillingham-based instruction. The intervention consisted of a 16-week reading program using an OG-based teaching technique. A 10-point Daily Probe of words read correctly was conducted for each student at the end of each lesson.

The Orton-Gillingham-based method of teaching is interactive, systematic and repetitive (Masons, 2008). As a student moves through the program, the student continues reinforcing learned skills while being introduced to new ones. Each new set of skills builds on the previous set of skills so that there is constant maintenance and review of learned materials. For students with reading difficulties, learning to read is an ongoing process. The OG-based approach uses maintenance, in the form of replication, and the incremental introduction of new skills. Orton-Gillingham requires mastery before moving on to a new skill. Because the use of review is steady and systematic, OG-based programs incorporate maintenance while teaching new skills.
**Description of student training.** The researcher tutored the students 2 or more times per week depending upon the circumstances which included: absences, suspensions, non-compliance, and schedule conflicts (See Appendix C). Although a tentative tutoring schedule was created, the researcher had to be flexible with the classroom teachers’ and students’ schedules. Students A, B, C, and D were tutored whenever possible, Monday through Thursday.

Prior to each lesson, the researcher conducted an informal assessment of the student’s sense of well-being. Following each lesson, the researcher recorded his personal observations of the student’s behavior, using the Student Behavior Record Sheet (See Appendix E).

Each lesson was individualized to teach a new skill or review a skill with which the student may have been having difficulties (students’ problematic areas). The lessons consisted of 6 activities. The lessons covered are all based on the OG multisensory teaching technique which includes: (a) visual drill, (b) auditory drill, (c) blending drill, (d) introduction of new skill [or review of the previous lesson], (f) oral reading and (g) a 10-point Probe using words from previously-learned and current skill sets. The visual, auditory, and blending drills teach phonics skills.

**Outline of Daily Procedures.**

At the beginning of each lesson the researcher spent about 2-3 min to put the student at ease and to assess the student’s mood; the researcher asked the student questions about how his day had been going. These interviews were intended to help the researcher see if there were any common trends or a relationships between the student’s
behaviors, mood and reading performance during each lesson compared with how many behavior points were earned.

The lesson consisted of 6 different drills: visual drill, auditory drill, blending drill, skill lesson, oral reading, and a 10-point probe. Following an initial, informal interview, the researcher began administering each of the 6 drills. After each of the drills were completed, the student was allowed free time for 10 to 15 min. prior to returning to their classroom. The free time activities included playing video games, shooting baskets, playing air hockey and playing pinball. The following section describes each of the drills in greater detail.

**Purpose and Description of Drills**

**Visual drill.** The purpose of the visual drill was to help the students to understand letter-grapheme connections. The input was the presentation of a visual cue on a grapheme flashcard. The output was the student’s auditory responses to the visual stimuli.

During the visual drill, the student reviewed all of the learned grapheme flashcards. The student was given grapheme flashcards, and responded with the grapheme sound. As the student progressed, blended consonant and vowel diagraph flashcards were added. Whenever the student made a mistake, the researcher gave the student the correct sound and asked the student to trace the letter on the card or write the letter in the sand three times while saying the sound out loud. After the third time, the student moved on to the next card.

**Auditory drill.** The purpose of the auditory drill was to help the student understand the sound while mentally visualizing the shape of the grapheme, and then
responding by writing the grapheme in a sand tray. The input was the sound of a phoneme. The output was the student’s tactile writing of the corresponding grapheme.

During the auditory drill, the researcher asked the student to look at the researcher’s mouth while the researcher said the first phoneme. For example, the researcher said the sound /a/ out loud and the student responded by repeating the sound /a/ out loud. The researcher asked “What spells /a/?” The student responded by saying, “_a_ spells /a/” then wrote the corresponding grapheme in the sand, underlining the grapheme in the sand while repeating the entire phrase “_a_‘ spells /a/” (Masons, 2008).

**Blending drill.** The purpose of the blending drill was to help the student practice saying the letter sounds out loud, and then blending the sounds together. The goal of the blending drill was to help the student with his decoding skills.

After the student finished the auditory and visual drills, he organized the grapheme flashcards into three different stacks, placing the vowel flashcards in the middle stack. The researcher asked the student to point to each grapheme in order, moving from left to right while saying the sound out loud and then blending the phoneme sounds together out loud. For example, if the letter combination was _m-a-n_, the student placed his finger on the table directly in front of first grapheme and said /m/, then repeated the action for /a/ and then for /n/. The student then slid his finger under the graphemes from left to right, blending the sounds together to form the word "man".

The grapheme combinations from the stacks of flashcards created both real and nonsense words. The researcher gave the student constant, positive feedback especially when blending nonsense words in order to reinforce that the student had blended the word correctly. The researcher paid attention to the grapheme combinations to insure that
the student was not practicing blending grapheme combinations which would not be found in real words. Whenever the student did not come up with the correct sound, the researcher said the sound out loud and asked the student to write the grapheme three times in the sand while saying the grapheme name and its sound out loud.

**Skill lesson [introduction of new skill or review].** The purpose of a Skill Lesson was to introduce a new skill to increase the student’s knowledge about phonics and to strengthen decoding skills or to review previously introduced material. During each lesson the student was taught using a multisensory approach, which included: visual, auditory, tactile and kinesthetic means of teaching language. Multisensory activities included: (a) mouth cues, (b) tracing, (c) writing in sand, (d) board writing, (e) sky-writing, and (f) oral reading.

When the researcher began to teach a new specific skill, the researcher started by presenting the student with an auditory activity, reading a list of words out loud, then having the student repeat them back. The researcher then asked the student probing questions such as: "What do all of these words have in common?" "Do you hear a similar sound in these words?" The student then attempted to identify any similarities he heard in the list of words. The researcher made sure to give the student ample time to respond. If the student failed to respond, the researcher provided cues or told the student what the words had in common. This method of teaching is known as guided practice. During guided practice the researcher provided probing questions to help the student to identify what sound the letter/letter combinations were making or to identify the rule being taught. This method of teaching involved the student in the lesson, helping the student to come up with the correct answers independently with minimal guidance. If the researcher found
the student was getting frustrated, the researcher provided the correct answer then asked the student to repeat the answer in his own words (Masons, 2008).

The researcher then provided a visual cue (list of the same words) for the student to review to see if he could identify the similarities and differences between the words. The researcher then gave the student the list of words that all shared similar characteristics for the student to read out loud. This gave the student a visual representation of the new skill being taught. The researcher then asked more probing questions to see if the student noticed any similarities or differences between the words.

**Oral reading.** The purpose of oral reading was to help the student practice reading words in context, to work with connected decodable texts, and eventually to be able to read and understand short stories. The researcher made sure to write appropriate and challenging reading material for the student to read out loud. If a student got stuck on a word, the researcher asked him to try to decode the word and provided cues when necessary.

The student used a marker or finger to point to each word. The researcher asked comprehension questions and discussed the meaning of individual words as well as discussed the passage being read. The sentences only included known words and sight words. Sight words are words that cannot be sounded out and must be memorized. The sentences read included sight words are often necessary for a sentence to have meaning. If the student could not read a sight word, the researcher immediately told the student the word in order to maintain the flow of reading. Comprehension questions were asked at the end of each sentence or group of sentences.
10-point probes. The purpose of the 10-point Probe was to assess the student’s ability to identify real words in the current skill set. The probe used whole words from a word list (10-point Probe) designed by the researcher (See Appendix D). The student was given a list of words using the graphemes with which he was familiar and asked to follow along with his finger while saying each word out loud. Whenever a student could not read a word within 3 seconds, the researcher asked the student to move to the next word.

Maintenance probes. The purpose of a Maintenance Probe was to assure that the student was retaining previously learned skills. At the beginning or end of a lesson, the researcher occasionally administered a Maintenance Probe from a previously-mastered skill set.

Review of lesson and behavior. The purpose of reviewing the lesson was to determine if the student had retained the information presented. The purpose of reviewing the student’s behavior was to determine the number of behavior points earned.

At the end of the lesson the researcher asked the student to summarize what he had learned. This was done by having the student explain which letter/s were learned and how they are spelled. Or, if a rule had been taught, the student was asked to explain the rule and tell when it should be applied. Whenever a student had difficulties with the lesson or did not understand the concepts, the researcher made sure to review the lesson during the next session until the student had successfully mastered the skill.

The researcher also asked the student to assess his own behavior during the lesson. The researcher helped the student to identify problematic behaviors to improve in the future. Then the researcher and the student discussed and assigned the number of reward points earned. Immediately following each lesson, rewards were given to the
students from the Treasure Chests located in the Head Teacher’s office, before returning to their classrooms (See Table 3).

Summary

The goal of the study was to measure the effectiveness of an OG-based approach on the reading skills of students with E/BD and reading difficulties. The students were selected from the specialized school located in Toledo, Ohio. Each student was given a specific treatment using an OG-based reading instruction with direct daily measures. The students were given a pre-test using DIBELS for first grade. After a 16-week period, the students were given a post-test using another version of the first grade DIBELS test to measure if the intervention improved the students’ reading scores.

The study was a single-subject, multiple-baseline across skill set design. The student's performance was compared to his own baseline scores. The hypothesis was: each student’s reading skills would improve following a 16-week intervention using an OG-based instructional method. The researcher believed the methodology used would be helpful to answer his questions because he was using both quantitative and qualitative data to measure the students’ reading abilities and behaviors.

The quantitative aspect of the study was the student’s reading skills and behavior measures during the sessions. The social validity aspect of the study was addressed using teacher and student questionnaires. This study design allowed the researcher to answer his primary question about whether or not an OG-based reading instruction would be an effective way to teach reading to students with E/BD and reading difficulties.
Chapter Four

Results

Introduction

The following chapter presents the results of this study. Pre-and post-test scores are given. The results of the students‘ daily probes of words read correctly are graphed and described. The results of the Interobserver Agreement (IOA) scores are given to verify the reliability of the teaching technique and the scoring of the 10-point probes. Data on the students‘ 10-point probes and behaviors are presented. Finally, social validity, as measured by the use of student and teacher questionnaires, is summarized.

Interobserver Agreement for Daily 10-point Probes

Data on the number of correct words decoded was collected by the researcher using a 10-point probe at the end of each lesson. All of the 10-point probes were audio-recorded in order to insure reliability of scoring. An Independent Observer (IO) was trained and collected data using the audiotape recording. A formula for calculating agreement scores for permanent products was used. The percentage of agreements was calculated by the number of agreements divided by the total number of agreements and disagreements, multiplied by 100 (Cooper, Heron, & Heward, 2007).

The IO scored 18% of the 10-point probes, across students, with an overall 95% rate of agreement, ranging from 80% to 100%. Table 4 presents the overall scoring of the weekly IO agreement process. The researcher‘s scoring is shown as Observer 1 (Obs 1), indicating the number of words read correctly. The IO‘s scores on the same student‘s performance are shown as Observer 2 (Obs 2). For a total of 9 sessions, the agreement
was 100%. On 5 sessions, there was a difference of one word read correctly between Obs 1 and Obs 2.

Table 4
Interobserver Agreement for Daily 10-point probes

<table>
<thead>
<tr>
<th>Week</th>
<th>Student</th>
<th>Obs 1</th>
<th>Obs 2</th>
<th>% Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C</td>
<td>10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>2</td>
<td>C</td>
<td>9</td>
<td>8</td>
<td>90%</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>4</td>
<td>B</td>
<td>8</td>
<td>9</td>
<td>90%</td>
</tr>
<tr>
<td>5</td>
<td>A</td>
<td>10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>6</td>
<td>C</td>
<td>10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>7</td>
<td>B</td>
<td>10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>8</td>
<td>C</td>
<td>9</td>
<td>10</td>
<td>90%</td>
</tr>
<tr>
<td>9</td>
<td>A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>10</td>
<td>C</td>
<td>5</td>
<td>3</td>
<td>80%</td>
</tr>
<tr>
<td>11</td>
<td>C</td>
<td>10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>12</td>
<td>B</td>
<td>10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>13</td>
<td>B</td>
<td>10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>14</td>
<td>B</td>
<td>10</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>15</td>
<td>A</td>
<td>9</td>
<td>8</td>
<td>90%</td>
</tr>
<tr>
<td>16</td>
<td>A</td>
<td>8</td>
<td>7</td>
<td>90%</td>
</tr>
</tbody>
</table>

Individual student means and ranges on 10–point probes are presented in Table 5. Reliability data was collected on 5 lessons for student A, with a mean agreement of 96%. For student B, the mean agreement was 98% for data collected on 5 lessons. There were 6 lessons for Student C in which reliability data was collected. His mean agreement was 93%. For Week 9, the randomly chosen lesson did not include a probe for Student A because 2 baseline probes were given in order for him to move on to the next set.
Table 5
*Interobserver Agreement for Daily 10-point probes by Individual Student*

<table>
<thead>
<tr>
<th>Student</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>96%</td>
<td>90-100%</td>
</tr>
<tr>
<td>B</td>
<td>98%</td>
<td>90-100%</td>
</tr>
<tr>
<td>C</td>
<td>93%</td>
<td>80-100%</td>
</tr>
</tbody>
</table>

**Procedural Integrity**

The researcher randomly selected one lesson per week for the Independent Observer (IO) to review to ensure the researcher followed the same protocol when teaching. This was to ensure that the experimental procedures were implemented as intended. The IO listened to audio recordings of the lessons and scored a Procedural Checklist of what the researcher did during each lesson. The overall mean agreement was 93% with results in the range of 78-100%. The percentage of agreements were calculated by the total number of agreements (460) divided by the total number of agreements and disagreements (496), multiplied by 100 (Cooper, Heron, & Heward, 2007).

The highest number of disagreements between the IO and the researcher were on questions 14(a and b) (See Appendix J). Question 14 asked, "If the student made a mistake, a) Did the researcher ask the student to write the grapheme in the sand or on the dry erase board three times before moving on? and b) Did the researcher provide the correct phoneme if the student could not come up with it?" The disagreement seems to be about whether or not the student made a mistake. If the student did make a mistake, the answer choices were “Yes,” “No” or “N/A.” Most of the disagreements between the IO and the researcher were between “No” and “N/A.”

Student A met with the researcher 31 times during the intervention. Of the 31 lessons, 16% were reviewed and scored by the IO with a 96% agreement on the
Procedural Checklist. The range of agreement for procedural integrity for Student A was 90-100%.

Student B met with the researcher 20 times during the intervention. Of the 20 lessons, 25% were listened to and scored by the IO with a 96% agreement on the Procedural Checklist. The range of agreement for student B was 94-97%.

Student C met with the researcher 22 times during the intervention. Of the 22 lessons, 22% were reviewed and scored by the IO with a 88% agreement on the Procedural Checklist. The range of agreement for Student C was 78-94%.

**Pre/Post-Test Measures**

Tables 6-9 present both the pre- and post-test DIBELS scores for each of the students in the study. The DIBELS benchmark assessments for 1st grade were given to all participants to assess basic literacy skills. The assessment included: Letter Naming Fluency (LNF), Nonsense Word Fluency (NWF), Phonemic Segmentation Fluency (PSF) and Oral Reading Fluency (ORF). Benchmark scores are only available up to 1st grade for LNF, NWF, PSF and ORF.

Additionally, an independent t-test was conducted across student performance on the DIBELS benchmarks for LNF, NWF, PSF and ORF. Results were as follows: a) the LNF score was: $t (2df) = .244, p > .05$, b) the NWF score was: $t (2df) = .128, p > .05$, c) the PSF score was: $t (2df) = .252, p > .05$, d) the ORF score was $(2df) = .496, p > .05$. Hence, as a group, the pre- and post-test gains on DIBELS assessments for LNF, NWF, PSF, and ORF were not statistically significant. These results should be viewed in relation to the duration of the intervention and small sample size.
**Student A.** Student A made improvements in all of the measures on the DIBELS 1st grade assessment between the pre-and post-test. Student A’s most significant improvement was in the area of NWF where he changed from the “emerging” range for first grade to the “established” range for first grade (See Table 6).

On the LNF pre-test, Student A scored 42, placing him on the “low risk” scale for first grade. Following the intervention, he scored 77, showing improvement yet still within the “low risk” range for first grade. On the PSF pre-test, he scored 26, placing him within the “emerging” range for first grade. After the 16-week intervention, he scored 43, placing him within the “established” range for first grade. On the NWF pre-test, he scored 43, placing him within the “emerging” range for first grade. Following the intervention, he scored 53, placing him within the “established” range for first grade. Finally, on the ORF pre-test, he scored 24, placing him within the “low risk” range for first grade. Following the intervention, he scored 32, placing him in the “some risk” range for the end of first grade. While he does not keep pace with typical learners in first grade, Student A was able to read 8 more words correctly per minute on the post-test for ORF from passages written at the first grade level.

<table>
<thead>
<tr>
<th>Student A</th>
<th>DIBELS PRE-TEST</th>
<th>DIBELS POST-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNF</td>
<td>42 (low risk)</td>
<td>77 (low risk)</td>
</tr>
<tr>
<td>NWF</td>
<td>43/12 (emerging)</td>
<td>53/15 (established)</td>
</tr>
<tr>
<td>PSF</td>
<td>26 (emerging)</td>
<td>43 (established)</td>
</tr>
<tr>
<td>ORF</td>
<td>24 (low risk)</td>
<td>32 (some risk)</td>
</tr>
</tbody>
</table>

**Student B.** Student B made improvements in all of the areas on the DIBELS assessments. Student B’s most significant improvement was in the area of ORF where he
improved his ORF score by 26 words per minute while reading a passage written at the first grade level. On the LNF pre-test, Student B scored 48, placing him on the "low risk" scale for first grade. Following the intervention, he scored 65, showing improvement by 17 letters, yet he was still in the "low risk" range for first grade. On the PSF pre-test, he scored 20, placing him within the "emerging" range for first grade. After the 16-week intervention, he scored 25, keeping him within the "emerging" range for first grade. On the NWF pre-test, he scored 68, placing him within the "established" range for first grade at the beginning of the year. Following the intervention, he scored 72, showing improvement and keeping him in the "established" range for first grade at the middle of the year. On the ORF he scored 57, placing him in the "low risk" range for first grade. Following the intervention, he scored 83, remaining in the "low risk" range for first grade (See Table 7).

Table 7
Student B: Pre/Post-Test Measures

<table>
<thead>
<tr>
<th></th>
<th>DIBELS PRE-TEST</th>
<th>DIBELS POST-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNF</td>
<td>48 (low risk)</td>
<td>65 (low risk)</td>
</tr>
<tr>
<td>NWF</td>
<td>68/17 (established)</td>
<td>72/19 (established)</td>
</tr>
<tr>
<td>PSF</td>
<td>20 (emerging)</td>
<td>25 (emerging)</td>
</tr>
<tr>
<td>ORF</td>
<td>57 (low risk)</td>
<td>83 (low risk)</td>
</tr>
</tbody>
</table>

Student C. Student C made improvements in 2 of the 4 areas on the DIBELS assessments. He made little improvement in PSF and decreased in LNF and ORF. Student C’s most significant improvement area was NWF where he moved from the "emerging" range for first grade to the "established" range for first grade (See Table 8).

On the LNF pre-test Student C scored 78, placing him on the "low risk" scale for first grade. Following the intervention, he scored 77, showing a decreased score keeping
him in the "low risk" range for first grade. On the PSF pre-test he scored 34, placing him within the "emerging" range for first grade. After the 16-week intervention, he scored 35, placing him within the "established" range for first grade. On the NWF pre-test he scored 41, placing him in the "established" range for first grade. Following the intervention, he scored 60, showing improvement, keeping him within the "established" range for first grade. On the ORF pre-test he scored 39, placing him within the "some risk" range for first grade. Following the intervention, he scored 30, placing him in the "some-risk" range for first grade.

Table 8
Student C: Pre/Post-Test Measures

<table>
<thead>
<tr>
<th>Student C</th>
<th>DIBELS PRE-TEST</th>
<th>DIBELS POST-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNF</td>
<td>78 (low risk)</td>
<td>77 (low risk)</td>
</tr>
<tr>
<td>NWF</td>
<td>41/10 (emerging)</td>
<td>60/17 (established)</td>
</tr>
<tr>
<td>PSF</td>
<td>34 (emerging)</td>
<td>35 (established)</td>
</tr>
<tr>
<td>ORF</td>
<td>39 (low risk)</td>
<td>30 (some risk)</td>
</tr>
</tbody>
</table>

**Student D.** Student D took the DIBELS pre-test. On the LNF, he scored 82, placing him on the "low risk" benchmark for first grade. On the NWF pre-test, he scored 41, placing him on the "emerging" range for first grade. On the PSF pre-test, he scored 23, placing him on the "emerging" range for first grade. On the ORF pre-test, he scored 39, placing him on "low risk" range for first grade. Student D withdrew from the intervention and refused to take the DIBELS post-test, so no further data is available (See Table 9).
Table 9
Pre/Post-Test Measures

<table>
<thead>
<tr>
<th>Student D</th>
<th>DIBELS PRE-TEST</th>
<th>DIBELS POST-TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNF</td>
<td>82 (low risk)</td>
<td>Not administered</td>
</tr>
<tr>
<td>NWF</td>
<td>41/8 (emerging)</td>
<td>Not administered</td>
</tr>
<tr>
<td>PSF</td>
<td>23 (emerging)</td>
<td>Not administered</td>
</tr>
<tr>
<td>ORF</td>
<td>39 (low risk)</td>
<td>Not administered</td>
</tr>
</tbody>
</table>

Daily Reading Probes

The following figures (Figures 1-4) present a graphical representation of each student’s performance on the independent variable across the 16-week period of the study. The 3 phases of the study were a) baseline, b) intervention, and c) maintenance. The top tier represents the student’s starting skill set as determined by the results of the DIBELS test and exploratory testing with 10-point probes. The second tier represents the next skill set level to which the student moved after mastering the previous skill set. Each consecutive tier represents the student’s progress throughout the study.

The first three data points on each tier, located to the left of the dotted vertical line, depict the student’s performance on his baseline 10-point probes for that skill set (closed data points). The next set of data points, located to the right of the first vertical dotted line, represent the student’s performance on 10-point probes during the intervention phase (closed data points). Once a student was able to complete three consecutive 10-point probes at a 90% accuracy rate (i.e., mastery), he moved on to the next skill set or tier for instruction. The horizontal dotted line in the baseline and intervention phases is the mean level line. During the 16-week intervention, the students were occasionally given 10-point probes to insure maintenance of previously mastered skills (open data points).
**Student A.** After the initial exploratory testing, Student A began instruction in Set 1. Figure 1 is a graphic representation of all 3 phases of the study for Student A.

For Set 1, Student A was given 3 baseline probes with results in the range of 5-8 with a mean of 6.6 words read correctly. During the intervention phase for Set 1, Student A was given 5 days of instruction and 5 separate probes with results in the range of 8-10 with a mean of 9.4 words read correctly. The percent overlap of the data plotted for performance across phases is 20%. There was an increasing trend during baseline, along with an increasing trend and a small amount of variability in the student’s performance during intervention. Following the intervention, Student A was given one maintenance probe for Set 1, scoring 10 words read correctly.

For Set 2, Student A began with 3 baseline probes with results in the range of 5-7 with a mean of 6 words read correctly. During the intervention phase for Set 2, he was given 6 days of instruction with probe scores ranging from 8-10 with a mean of 9.3 words read correctly. There was a zero percent overlap between the two phases. There was an increasing trend in the baseline and the intervention phase with a change in level. Two maintenance probes were given, each with two scores of 10 words read correctly.

For Set 3, Student A was given 3 baseline probes with results in the range of 7-9 with a mean of 8 words read correctly. During the intervention phase for Set 3, Student A was given 3 days of instruction with results in the range of 9-10 with a mean of 9.6 words read correctly. The percent overlap of data plotted for performance across phases was 33%. There was variability of performance during the baseline phase, with an increase in trend during the intervention phase, with a change in level. Student A was given one maintenance probe for Set 3 with a score of 9 words read correctly.
For Set 4, Student A was given 3 baseline probes with results in the range of 6-7 with a mean of 6.3 words read correctly. During the intervention phase for Set 4, Student A was given 3 days of instruction with results in the range of 9-10 with a mean of 9.6 words read correctly. There was a zero percent overlap between the two phases. The baseline phase showed a decreasing trend. There was an increasing trend in the intervention phase with a change in level. He was given one maintenance probe with a score of 9 words read correctly.

For Set 5, Student A was given 3 baseline probes with results in the range of 8-9 with a mean of 8.6 words read correctly. During the intervention phase for Set 5, Student A was given 3 days of instruction with results in the range of 9-10 with a mean of 9.3 words read correctly. The percent of overlap of data plotted from performance across phases was 66%, with little variability between the baseline and intervention phases with a change in level. He was given one maintenance probe with a score of 8 words read correctly.

For Set 6, Student A was given 3 baseline probes with results in the range of 9-10 with a mean of 9.6 words read correctly. This performance level eliminated the need to give instruction in Set 6. There was zero percent overlap in the baseline and intervention phase as Student A was only given 3 baseline probes and immediately achieved mastery with a change in level. He was given 2 maintenance probes with scores of 9 and 10 words read correctly.

For Set 7, Student A was given 3 baseline probes with results in the range of 0-4 with a mean of 3 words read correctly. During the intervention phase for Set 7, Student A was given 3 days of instruction with results in the range of 9-10 with a mean of 9.3 words
read correctly. There was a zero percent overlap between the two phases. There was an increasing trend in baseline and Student A showed an immediate increase in performance in the intervention phase, quickly achieving mastery with a change in level. After the intervention phase, he was given one maintenance probe with a score of 9 words read correctly.

For Set 8, Student A was given 3 baseline probes with results in the range of 4-5 with a mean of 4.3 words read correctly. During the intervention phase for Set 8, Student A was given 8 days of instruction with results in the range of 6-9 with a mean of 6.8 words read correctly. The baseline phase showed little variability. There was a zero percent overlap between the two phases and Student A was making steady improvement during the intervention phase. No maintenance probes were given because the study ended before Student A could attain mastery of Set 8.

During the course of the study, Student A began his baseline probes in skill Set 1. He was able to progress through 7 skill sets and had begun working in Set 8 when the study ended. Student A did a good job listening and following directions during each lesson. He met with the researcher a total of 31 times during the 16-week intervention. He was cooperative with the researcher and made steady improvements in his word reading skills. In each skill set, Student A made steady improvement and regularly moved through the tiers of skills. All of his probe scores indicate an upward trend and an increase in performance from his baseline probe scores to the completion of each skill set (See Figure 1).
Figure 1. Student A: Probe Scores
**Student B.** After the initial exploratory testing, Student B began instruction in Set 6. Figure 2 is a graphic representation of all 3 phases of the study for Student B.

For Set 6, Student B was given 3 baseline probes with results in the range of 6-8 with a mean of 7.3 words read correctly. During the intervention phase for Set 6, Student B was given 5 days of instruction and 5 separate probes with results in the range of 5-10 words read correctly with a mean of 8.4. The baseline phase showed some variability. The percent overlap of the data plotted for performance across phases is 20%, with 20% of the data plotted during the intervention phase falling below the baseline phase. Student B began the intervention phase with an upward trend then fell below baseline in Set 6 before making steady improvement in the intervention phase. Following the intervention, Student B was given 3 maintenance probes for Set 6, with a range of 8-10 words read correctly.

For Set 7, Student B began with 5 baseline probes with results in the range of 5-7 words read correctly with a mean of 5.8. During the intervention phase for Set 7, he was given 3 days of instruction with probe scores ranging from 9-10 with a mean of 9.6 words read correctly. There was a zero percent overlap between the two phases. Student B showed variable scores during baseline and then quickly achieved mastery during the intervention phase with a change in level. Two maintenance probes were given, each with two scores of 10 words read correctly.

For Set 8, Student B began with 3 baseline probes with results in the range of 5-7 with a mean of 6.3 words read correctly. During the intervention phase for Set 8, he was given 12 days of instruction with probe scores ranging from 5-10 with a mean of 7.6 words read correctly. The percent overlap of the data plotted for performance across
phases was 41%. The baseline phase showed some variability. During the intervention phase, Student B demonstrated a slight increasing trend with some variability, with his final two probes having 100% accuracy. No maintenance probes were given for Set 8 because the study ended before the student could complete Set 8.

During the course of the study, Student B tested into skill Set 6. He was able to progress through 2 skill sets and had begun working in Skill Set 8 when the study ended. He met with the researcher a total of 20 times during the 16-week intervention. Student B had variable scores on his probes, although he maintained steady improvement in his word reading skills throughout the course of the study.
Student C. After the initial exploratory testing, Student C began instruction in Set 1. Figure 3 is a graphic representation of all 3 phases of the study for Student C.

For Set 1, Student C was given 3 baseline probes with results in the range of 6-8 with a mean of 7.6 words read correctly. During the intervention phase for Set 1, Student C was given 5 days of instruction and 5 separate 10-point probes with results in the range of 7-10 with a mean of 9.2 words read correctly. The percent overlap of the data plotted for performance across phases was 40%. During baseline there was an increasing trend,
while during intervention there was an initial decrease in performance on the first 3 probes, followed by mastery.

For Set 2, Student C began with 3 baseline probes with results in the range of 4-7 with a mean of 6 words read correctly. During the intervention phase for Set 2, Student C was given 9 days of instruction and 9 probes with a range of 5-10 with a mean of 8.1 words read correctly. The baseline phase showed variability. The percent overlap of the data plotted for performance across phases was 33%. Student C scored one data point above baseline followed by a decreasing trend before making steady progress in Set 2 with an increase in level. Student C was given one maintenance probe with a score of 10 words read correctly.

For Set 3, Student C began with 3 baseline probes with results in the range of 6-8 with a mean of 7.3 words read correctly. During the intervention phase for Set 3, Student C was given 6 days of instruction and 5 probes with a range of 5-10 with a mean of 7.4 words read correctly. There was an increasing trend during the baseline phase. There was a zero percent overlap between the two phases, although 40% of the data plotted for Student C's intervention phase fell below his baseline scores. After the initial decrease, Student C made rapid progress achieving mastery in Skill Set 3 with an increase in level.

For Set 4, Student C began with 3 baseline probes with results in the range of 1-7 with a mean of 3.3 words read correctly. During the intervention phase for Set 3, Student C was given 3 days of instruction and 3 probes with a range of 9-9 with a mean of 9 words read correctly. There was zero percent overlap between the two phases. There was an increasing trend in the baseline phase and, during the intervention phase, Student C quickly achieved mastery.
Student C initially tested into Skill Set 1. He was able to achieve mastery in 4 skill sets. He met with the researcher a total of 22 times during the 16-week intervention. Student C showed variable scores throughout his baseline and intervention phases, slowly moving through each level.
Figure 3. Student C: Probe Scores

**Student D.** After the initial exploratory testing, Student D began instruction in Set 2. Figure 4 is a graphic representation of all 3 phases of the study for Student D.
For Set 2, Student D began with 3 baseline probes with results in the range of 5-9 with a mean of 6.6 words read correctly. During the intervention phase for Set 2, Student D was given 4 days of instruction and 5 probes with a range of 7-10 with a mean of 8.8 words read correctly. The percentage of overlap of the data plotted for performance across phases was 80%. The baseline phase showed variability. In the intervention phase, after an initial decrease, mastery was quickly achieved.

For Set 3, Student D began with 3 baseline probes with results in the range of 5-8 with a mean of 6.3 words read correctly. During the baseline phase, there was variability in performance. During the intervention phase, Student D was given 1 day of instruction and 1 probe with a score of 4, which fell below the baseline. Student D then withdrew from the study.

Figure 4. Student D: Probe Scores
Student Behavior

During each instructional session, student behavior was measured on a 20-point scale. Individual student behavior scores were then compared to the 10-point probe scores of words read correctly for the corresponding lessons to determine if there was a correlation between the students’ behavior scores and their performance on the daily probes. The following graphs are visual representations of the students’ behavior as compared to the number of words read correctly at the end of each lesson. The solid, vertical bars represent the students’ behavior during each lesson. The horizontally-connected dots represent the students’ performance on the daily words read correctly. Each graph is divided into different sections by a dotted line to depict the beginning of a new set of skills.

The researcher analyzed the relationship between the behavior and the performance in four different categories: (a) high behavior scores with high probe scores (HH), (b) low behavior scores with low probe scores (LL), (c) high behavior scores with low probe scores (HL), and (d) low behavior scores with high probe scores (LH). The two expected results were HH and LL. Unexpected result categories were HL and LH. High scores for behavior were 18 and above, and high scores for 10-point probes were 9 or 10.
Figure 5. Student A: Behavior/Words Read Correctly

**Student A.** The researcher met with Student A 31 times. Student A did not have difficulty maintaining good behavior during the intervention. His behavior scores were in the range of 19-20, with a mean of 19.9. Throughout the study, Student A’s probe scores were consistently high. On 23 occasions, Student A scored a 9 or a 10 on words read correctly and a 20 on behavior. Seventy-three percent of Student A’s performance on his probes in relationship to his behavior were in the expected category of HH. There were no instances of low behavior scores. The unexpected results of 27% were all in the HL category. On Lessons 25-27, Student A scored 20 on behavior but had fewer words read correctly due to new material being introduced. For example, during Lesson 25, Student A was introduced to Set 8 (See Figure 5).

For Set 6, Student A was able to achieve mastery during the baseline phase, so the researcher moved on to Set 7. Student A had difficulties reading words at the beginning of Set 8, but made steady improvements from one lesson to the next while maintaining
good behavior. Student A stayed focused during each lesson, was able to complete 7 skill sets and began working on Set 8. Looking at his scores, there does seem to be a pattern between high behavior scores and the number of words read correctly.

![Graph showing behavior and words read correctly for Student A and B](image)

\textit{Figure 6. Student B: Behavior/Words Read Correctly}

\textbf{Student B}. The researcher met with Student B 20 times. Student B did not show a great deal of variation in his behavior, with behavior scores ranging from 13-20, with a mean behavior score of 18.15. Student B had 65\% rate of expected performance in relationship to behavior, with 35\% in HH and 30\% in the LL categories. Student B’s unexpected results were 35\%, with 30\% in the HL and 5\% in the LH categories.

Student B consistently had lower scores on his probes at the beginning of each set and gradually improved until achieving mastery. Examining the graph, Student B made
improvements and scored best on his probes when he got a 20 for his behavior. He was able to complete Set 6 and Set 7 and was making steady improvements in Set 8.

On 6 occasions, Student B scored 9 or 10 on words read correctly with a 19 or 20 on behavior scores. On Session 10, Student B scored 7 on words read correctly and 14 on behavior. On 2 occasions, he scored 5 on words read correctly and 20 on behavior (See Figure 6).

---

**Figure 7. Student C: Behavior/Words Read Correctly**

**Student C.** The researcher met with Student C 22 times. Student C had significant variability in his behavior scores, ranging from 7-20, with a mean of 15. Both his behavior scores and his scores on words read correctly appear to fluctuate in Sets 1 and 2 without correlation. Student C had a 58% rate of expected behavior in relationship to performance, with 73% in the HH and 27% in the LL categories. The unexpected rate was 42%, with 50% in the HL and 50% in the LH categories.
On Set 3, the graph appears to show a pattern between his behavior scores and the number of words read correctly. On Lessons 16 and 18 he had a low behavior score and fewer words read correctly. During Lesson 18 and Lesson 20, he had low behavior scores and he walked out of both sessions before completing a 10-point probe of words read correctly (See Figure 7).

On 10 occasions, Student C had scores of 9 or 10 on words read correctly with behavior scores of 19 or 20. On 4 occasions, he had low behavior scores and low scores or no data for words read correctly. For 5 of the lessons Student C showed a disconnect between behavior with high behaviors scores with low probe scores and for 5 of the lessons he had low behavior scores with a high number of probe scores.

Figure 8. Student D: Behavior/Words Read Correctly
**Student D.** The researcher met with Student D 9 times. Student D had a range of behavior scores from 0-20 with a mean of 14. Student D had an 86% rate of expected behavior in relationship to performance, with 57% in the HH and 29% in the LL categories. Student D had a 14% rate in the unexpected category of HL.

On 2 occasions, Student D walked out of the room during the lesson and did not complete his 10-point probes. He only completed Set 2 and had begun working on Set 3 before withdrawing from the study. Student D willingly participated in the study for the first 2 weeks, once during the second month, and twice during the third month before completely dropping-out. On 17 occasions, Student D often refused to work with the researcher, was suspended from school for disruptive behavior, was removed from the school premises by the police, or was absent during his scheduled time with the researcher. In the beginning of the study, when Student D participated, his daily probes scores were in the range of 7-9. When his behavior scores were high, he also scored high on his daily probes (See Figure 8).

Student D began the intervention in a cooperative manner, completing one skill set during the first 4 lessons. During the fifth lesson, Student D completed the Visual Drill and then walked out in anger. He refused to participate during Lesson 6, displaying violent, explosive behavior, throwing a trashcan across the room and then walking out. He cooperated during Lesson 7, but his behavior deteriorated again during Lesson 8 and Lesson 9. At this time he withdrew from the study without completing another skill set.

In conclusion, the researcher was unable to detect a direct correlation between behavior and performance. However, the researcher did notice patterns in Student A, B, C and D, showing that higher behavior scores tended to result in higher numbers of words
read correctly. The researcher expected cooperative behavior of students to result in 90-100% of words read correctly on daily 10-point probes. The actual overall results were 72% in the expected categories of HH and LL and 29% in the unexpected HL and LH categories. Of the unexpected results, almost 68% were in the HL category and just over 32% were in the LH category.

Three of the 4 students reported that they enjoyed working one-to-one with the researcher. Student A demonstrated his excitement by skipping down the hallway to get to the researcher’s classroom. Every time the researcher met with Student A, the researcher asked if Student A enjoyed their time together; Student A always responded, “yes” while vigorously shaking his head in an affirmative manner. At the end of each lesson, Student A often asked, “Do we got extra [free] time?” After Student B experienced a frustrating lesson of arguing with the researcher, he said, "Are you going to be here Thursday? Come get me Thursday—not Wednesday," expressing enthusiasm for the next lesson. This supports that Student B enjoyed the one-to-one attention and looked forward to meeting with the researcher again. Student C showed his regard for the researcher by frequently offering assistance to the researcher, such as “Want me to help you get your stuff?” and, when the researcher thanked him for his assistance, Student C responded, “Anytime!”

Student B and Student C were primarily motivated by the rewards. Student B often asked, “Can I have a McDonald’s gift card?” and wanted to know how many reward points he had accumulated towards his next big prize. Student C said, “Can I go get some Skittles?” and/or “Do I get Hot Cheetos?” Student C also said, “I’m going to give your [reward] cars back. I’m going to give you everything back. I can’t do it no
more.” Student C often asked, “How many [reward] points do I got?” Between the drills, Student C asked, “Can I shoot [basketball] one time?”

Student B and Student C often expressed frustration during the lessons regarding the instructional materials. Student B often put his head down on the desk and would not make eye contact with the researcher. Even before starting the drills, Student B was frequently in a hurry to finish the lesson and return to his regular classroom, saying “Can we only do a couple of things?” During the blending drills, Student B frequently refused to attempt to blend the sounds and pronounce the nonsense words, saying, “I can't say the freakin' word.” During the lessons, Student B often got frustrated and when asked a question would respond, “I don’t know. I don’t know.” “When are we gonna be done? or You're making me confused!” In the middle of a lesson, he said "I only got 5 more minutes." "I don't freakin' know. I'm going back to my class." Student C had difficulties with the letter sounds for /i/ and /e/, expressing his frustration by saying, “The ‘E‘ is hard. I want to rip the ‘E‘s‘ up.” Before reading the probe cards, Student C said, “I hate these cards!” Referring to the auditory drill, Student C said, “I hate putting my fingers in the sand.”

Social Validity After the study was completed, the students and teachers were asked to respond to a questionnaire (See Appendices H and I). The teachers were asked if they had noticed any difference in the students’ academic performance and behaviors. The students were asked about their overall satisfaction with the program and if they felt their reading had improved.

All 3 of the teachers agreed that while there was no change in student behavior, student academic achievement did improve with one-to-one OG tutoring. The classroom
teacher for Student A noted that Student A used his learned decoding skills in the regular classroom and noted that his oral reading skills improved. The teacher for Student B said that he became more confident and more willing to read in the classroom, complete school assignments and participate in class activities. The teacher for Student C described him as more motivated during reading and language instruction during the intervention.

All 3 of the students believed their reading improved and said they felt more confident in their regular classroom assignments, had fun, and enjoyed working with the researcher because he was nice.” All 3 students said they preferred Oral Reading over the other drills because they liked reading out loud. One student said he liked the funny sentences.

The overall consensus of the teachers and the students was that the intervention improved the students’ reading skills. The students all agreed that it was an enjoyable experience and that they liked working with the researcher in this way.
Chapter Five

Discussion

This chapter discusses the use of an OG-based reading intervention as tested across skill sets with 4 male students with E/BD and reading difficulties. Each research question is discussed separately. Limitations to the study are addressed, followed by implications for future research.

Relationship of Results to Research Questions

What effects will an Orton-Gillingham-based intervention program have on the decoding skills of students identified as E/BD and reading difficulties?

Results collected on the DIBELS post-test measures were found to be not statistically significant for Nonsense Word Fluency (NWF) or Oral Reading Fluency (ORF). Three of the 4 students made improvements on their raw scores on their NWF. Student, A and Student C both moved from the “emerging” to the “established” category on the DIBELS benchmark for NWF showing a change in level and improvement in their ability to decode nonsense words. The ability to decode nonsense words has been proven to help students when decoding real words (Gillingham & Stillman, 2000). Additionally, results of the daily measures during each lesson indicate that each student who completed the study progressed and mastered skills at decoding. Student A steadily progressed through seven skills sets, Student B completed 2 skills sets, and Student C accomplished four skill sets.

These findings may have not shown statistically significant results either because the intervention was not long enough, or the number of students was limited, or because the use of an Orton-Gillingham based reading intervention is not an effective way to
teach students with E/BD paired with reading difficulties. Consequently, the improvements in the students raw scores on the DIBELS post-test measures cannot be directly attributed to an Orton-Gillingham based reading intervention although 3 of the 4 students did show improvements in raw scored decoding skills following the intervention.

What, if any, is the correlation between tutees’ classroom behavior during the reading intervention compared to the overall success of the intervention?

The relationship between the tutees’ behavior and the overall success of the intervention seems to reveal a pattern, but not a direct correlation. The pattern suggests that the more involved and attentive the students behaved, the more lessons they were able to complete; the more lessons completed, the greater the overall success of the intervention. No statistical analysis was performed to determine the exact correlation between students’ behavior and the overall success of the intervention. The reliability of the behavior scoring was not validated by an independent observer.

The researcher’s hypothesis of expected performance was that cooperative behavior would result in a high percentage of words read correctly, and that disruptive behavior would result in a lower percentage of words read correctly. In this study, approximately 70% of these results were in the expected categories of a high behavior score with a high probe score (HH) or a low behavior score with a low probe score (LL), supporting the researcher’s hypothesis. Of the unexpected results, 68% were in the category of a high behavior score with a low probe score (HL) and 32% fell in the category of a low behavior score with a high probe score (LH). Some of the high behavior scores paired with low probe scores can be attributed to the fact that daily probes of words read correctly were typically lower when new material was being introduced.
Do students with E/BD enjoy the Orton-Gillingham-based intervention for reading instruction?

The 3 students who completed the intervention reported that they enjoyed the intervention, but they did not give many specific reasons—except that they liked working with the researcher. Student A noted that he liked “reading out loud” and the “funny sentences” composed by the researcher. Student B said that he enjoyed “playing in the sand”. Student C mentioned that he thought the researcher was “nice”.

The researcher observed and recorded in his Field Notes that the students enjoyed the one-to-one attention, getting out of the regular classroom, the abundance of rewards and the free time they received more than they liked the actual instruction.

What are the classroom teachers’ impressions of the effectiveness of the Orton-Gillingham-based reading instruction on students’ academic learning?

Student A’s teacher stated that Student A “has also been using his decoding skills” in the classroom and showed an increase in the student’s confidence. Student B’s teacher strongly agreed that the use of an OG-based reading intervention was an effective way to work with students with E/BD and reading difficulties. He noted that Student B “became more willing to read, complete school work and participate,” and said, “I wish all of my struggling students had the opportunity of working one-to-one with a reading instructor.” Student C’s teacher said that he was “more motivated than before during reading and language.” On a related question, 2 of the teachers neither agreed nor disagreed with the assertion that having an OG tutor was effective.
The researcher did not teach the OG-based method to the classroom teachers, nor did the classroom teachers show interest in the researcher’s instructional method. The teachers’ responses about the Orton-Gilligham method were not informed responses. What are the classroom teachers’ impressions of the effectiveness of the Orton-Gillingham-based reading instruction on students’ behavior?

All 3 of the teachers indicated “no change” in student classroom behavior attributable to the OG-based reading intervention. Although the teachers did not believe that the intervention had improved behaviors, their comments indicated that the students became more engaged in classroom instruction, demonstrating a positive behavior change.

Limitations

The research in this study provides limited evidence to support the use of an OG-based method of reading instruction for use with students with E/BD and reading difficulties. Several limitations to this study should be considered when interpreting current findings and for future research with this population of students.

Participants and setting. All of the participants in the study came from a self-contained school for students with E/BD. The school had a behavior management program in place to control disruptive behavior. The school’s behavior management program was applied differently by different teachers, resulting in inconsistent expectations and behaviors of the students. The researcher was introduced to the behavior management system at the school, but was never trained on implementation. Hence, it was necessary for the researcher to design a consistent behavior management plan which would function within the school’s behavior management system. The effects of
operating a behavior management system within another behavior management system on the relationship between students’ behavior and probe scores is unknown, which calls into question the results of this study.

Since the intervention was conducted in a special education school for students with E/BD, the setting limits the external validity of the study. Because the students were taken out of their regular classroom setting to work with the researcher in a one-to-one setting, the findings of this study cannot be generalized to all classroom environments. The number of students who participated was limited to 4 because there was only one researcher to collect data during the 16-week time period.

**Scheduling.** In general, the students were unable to meet with the researcher on a regular basis. A schedule was created at the beginning of the study (see appendix C) but the students and classroom teachers did not abide by the schedule. Another limitation in the scheduling was that some of the students were often absent from school due to suspensions or illness. These scheduling conflicts resulted in a different total number of lessons for each student, ranging from 8 lessons for Student D to 31 lessons for Student A during the same time period. For example, Student A met with the researcher 2-3 times a week because he was often the only student available. Student B was absent due to family problems and at one point was admitted into a hospitalization program where he was monitored by health professionals. As mentioned earlier, Student C had a wide range of behaviors, from cooperative and attentive to highly-disruptive. When Student C was cooperative and on task the researcher was able to quickly move through the material although when he was distracted, or did not want to behave during the lesson little work was accomplished.
Student attendance was an ongoing issue impacting the application of the intervention. Student A had 3 unexcused absences from school during the 16-week study. Student B was absent a total of 16 days, 4 of which were unexcused. Student C had 14 unexcused absences. Student D had 2 excused absences, 2 alternate placements, 9 unexcused absences and 10 days of suspensions. On 2 occasions he was removed by the police. The frequency of absences and suspensions made it difficult to maintain a consistent schedule which resulted in a variety of time lapses between lessons. While some of the students were able to meet with the researcher once or twice a week, some of the students went several days or even weeks between lessons.

Another limitation was the duration of the intervention. A 16-week period does not appear to be long enough to show significant changes in the students’ reading abilities.

**Treatment.** Baseline stability was not established prior to administering the intervention. Consequently, there was overlap between baseline and intervention scores, resulting in a less convincing treatment effect. So a longer time spent on establishing baseline may help to reduce the amount of overlap between baseline and during the intervention phase (Parsonson & Baer, 1978).

One of the difficulties during the 16-week intervention was the limited amount of time the researcher had to spend with each student. Initially, the researcher was going to meet with the students twice a week for 45 minutes per session. The allotted 45-minute timeframe did not appear to be a sufficient amount of time to complete all of the drills and incorporate tangible rewards and free time.
At the beginning of each lesson, the researcher had to telephone the teachers or go to the students’ classrooms to see if they were available. Once the researcher and student got into the intervention room it took several minutes to get the student situated and on-task. Much of the allotted time was spent negotiating with the students about which rewards they would receive for working with the researcher.

The researcher also believes it would have been beneficial to give the students free time activities between drills, such as shooting basketballs, playing cards or doing something the student enjoyed. The amount of time allocated for each lesson was insufficient for the alternating of instruction with the reward of free time between the drills which may have been a more effective way of motivating the students.

The school’s behavior management program was saturated with rewards, undermining and rendering the researcher’s reward system as insufficient for motivation. The students had outlandish requests for items such as video games, cash and other rewards inappropriate for them to receive every day. Some of the students found the instructional drills to be monotonous and were reluctant or refused to complete them. Students had the option to refuse to come and work with the researcher on particular days without consequences. So refusal was common.

The behavior points given to the student at the end of the lesson did not accurately depict the students’ behaviors during the intervention. Point allocations for behaviors were awarded at the end of each lesson in order to reward students for their performance rather than being scored following the lessons using the audio recordings. However, reviews of the audio recordings revealed that the post-lesson allocations were too
generous. The researcher’s generosity of point allocation enabled him to end each lesson on a positive note in order to motivate the students to come to the next lesson.

**Social Validity.** Student questionnaires could have been enriched by describing the individual drills, asking more specific questions about the student’s feelings regarding the intervention, and fewer questions about the researcher. Student responses could not be quantified because the questionnaires did not use a Likert scale. Teacher questionnaires could have asked more specific questions about behaviors and reading skills. Additional questionnaires regarding reading and social behaviors could have been given to a broader population (i.e., gym teacher; parents; art teacher; etc.).

There was no procedural checklist regarding student behavior during the intervention. The researcher’s behavior point allocation was not monitored by an Independent Observer so there is no data regarding percentage of agreement.

**Implications**

Implications of this study may be relevant to special education reading teachers/tutors, parents, juvenile detention centers and school systems serving students with E/BD and reading difficulties. Many students with E/BD have reading difficulties and it is important to find more effective ways to teach reading to this population of students (Barton-Artwood, et. al., 2010).

Special education teachers and tutors who work with students with E/BD with reading difficulties can benefit by learning more about the use of an OG-based multisensory approach to teaching reading. Teachers who work at the tertiary level will have a better understanding of how essential it is to engage students in one-to-one instruction and to teach basic phonics skills with this population of students. Basic
phonics skills can help students to become better at decoding words (Gillingham & Stillman, 2000). Teachers and tutors should use positive reinforcement in order to motivate these students, but be careful not to saturate them with rewards. Saturating with rewards can reduce the motivating effect of the rewards. There should be a balance between systematic, explicit instruction and a strong motivational system.

School systems, juvenile detention centers and other agencies providing reading instruction for students with E/BD and reading difficulties should consistently apply a behavior management system in order to help reduce disruptive behaviors and create an overall learning environment where rewards have consistent value as motivating factors (Abrams, 2005). Tertiary level intervention should be provided, including one-to-one instruction on a regular basis.

Parents can learn the importance of tertiary, one-to-one instruction for their child with E/BD and reading difficulties. It is important for parents to know that reading instruction should take place in a positive learning environment with a consistently-applied behavior management system, one-to-one instruction, and a focus on phonics

Suggestions for Future Research

The results of this study provided some evidence of the effectiveness of an OG-based reading intervention for students with E/BD and reading difficulties as shown on the students’ DIBELS post-test raw scores. Future research is needed, however, to prove the overall effectiveness of this multisensory, phonics-based approach to teaching reading.

Participants and setting. Future researchers should be trained prior to the intervention in the use of the behavior management system at the facility where the study
is to take place. Studies should be conducted in settings where a behavior management system is already in place and consistently applied.

In order to increase the external validity, it would be beneficial to replicate this study with more student participants. Another suggestion is to have more researchers trained in the OG-based method which would make it possible to tutor more students during the same time period. The OG-based method could be administered with small groups of students similar to the 1987 study by Vickery, Reynolds and Cochran.

**Scheduling.** Another limitation to this study was that all of the students received a different number of lessons. A more accurate study would meet with all of the students on a consistent basis for the same number of lessons during the same time period and for the same duration of time. Future research should be conducted in a learning environment where the school schedule is consistent enough to provide for a regular time period for the intervention to take place. The time period for future studies should be longer than 16-weeks in order to gather more data.

Future researchers should require students to remain in the study room whether or not they participate in the lessons. Refusals to participate should be recorded as a low behavior score and daily probes should be given regardless of lack of participation during the lesson. This will allow the researcher to see a more accurate picture of the relationship between behavior and words read correctly.

In future research, the time allotted for each lesson should be extended to one hour in order to get the student settled and ready to work, accommodate for more free time and the alternating of immediate intangible rewards with instructional drills.
Classroom teachers should be aware of the tutoring schedule and make sure that the student goes to the study room at the appropriate time.

The researcher believes the study may have been more successful if each lesson began with free time in order to motivate the participants to leave their regular classrooms in order to work with the researcher. Another benefit of free time at the beginning of each lesson would be that the researcher could conduct and record a pre-interview in an informal manner while the student is engaged in a recreational activity.

**Treatment.** Future studies might focus on finding a variety of ways to present the instructional materials in order to keep the students engaged in the drill activities. Data could be collected to analyze if any one element of the instructional package is more effective than the other. A study might isolate and focus solely upon NWF.

Prior to the intervention, baseline scores should be stabilized. A longer period of time and a greater number of baseline probes would help to stabilize the baseline scores and reduce the amount of overlap between baseline and intervention (Parsonson & Baer, 1978).

Behavior management during the intervention should focus on rewards specific to the preferences of the individual student. Such rewards should be extensively negotiated between the researcher and the participant prior to the intervention. Sufficient time should be spent to establish proper motivators for each student using reinforcement samplers.

Future researchers should use behavior point allocations as an immediate reward for cooperative behavior, but researchers should also listen to the recorded lessons and make a second set of point allocations as a more accurate record of behaviors. This
second set of records would serve as the behavior scores used to compare with the number of words read correctly in order to detect any corresponding patterns.

**Social Validity.** The social validity of this study was measured using questionnaires for both students and teachers. Both the students’ and teachers’ questionnaires could have been expanded asking more questions regarding the treatment, and student questionnaires could have used the Likert scale to quantify their responses.

The students’ questionnaires were made up of questions that they were to respond to as “Yes,” “No” or “Stayed the same”. A better questionnaire would ask the students more in-depth questions about the drills by first describing all of the drills and then asking the students which drill they most enjoyed. Another method would be to conduct an informal post-intervention interview. This type of interview might result in more enriched data regarding the students’ thoughts about the study. Such informal interviews could result in more enriched, qualitative data regarding the students’ moods and feelings about the intervention.

The teachers were given a questionnaire using a Likert scale to see if they had noticed any changes in the students’ classroom performance and behavior. Some of the questions inquired about the OG-based method with which many of the teachers were unfamiliar. Future research questions should focus more on specific changes in student behaviors during academic subjects or other activities. Other questions should focus on how the students behaved in the regular classroom immediately following meeting with the researcher. In this study only the teachers and students were given a post-interview questionnaire. Future researchers should administer questionnaires to parents, counselors and other staff members who deal with the students on a daily basis.
Future studies should include a behavior checklist detailing student behavior. An Independent Observer (IO) should listen to the audio recording of the entire lesson and score the students’ behavior using the same behavior checklist as the researcher. The IO scores and the researcher scores should be compared for percentage of agreement.

**Summary**

The aim of this study was to test the use of an OG-based reading intervention for students with E/BD and reading difficulties. Research questions addressed during the study included: the effects of an OG-based reading intervention on students' ability to decode words; students' behavior during the lessons as compared to the number of words read correctly; students' satisfaction with an OG-based reading intervention; and teachers' impressions of the effectiveness of an OG-based reading intervention on students' academic skills and behavior. The results of this study indicate that some students may benefit from the use of an Orton-Gillingham reading intervention.

Three of the 4 students who participated in the study increased their raw scores on the NWF as measured by the DIBELS post-test. The study did not find a direct correlation between students' behaviors and the number of words read correctly, but a pattern of cooperative behavior that corresponded with improved performance was observed. Three of the 4 students who participated in the study responded that they enjoyed working with the researcher and the reading intervention. Three of the students said the lessons were "boring". The students' classroom teachers gave positive responses about the students' transference of learned decoding skills across academic areas. The teachers did not notice any improvement in the students' disruptive behaviors in the regular classroom. Although some of the teachers reported a change in the students'
classroom participation and the application of learned skills in the regular classroom. The results indicate that there were no statistically significant changes in the students post-test reading scores following a 16 week Orton Gillingham and based reading intervention. Further research needs to be done using an Orton Gillingham based reading intervention with students having E/BD paired with reading difficulties.
References


*Corrective Reading Series.* Columbus: SRA McGraw-Hill.


University of Oregon Center on Teaching and Learning, C. (2010). *DIBELS Data System.* Retrieved from https://dibels.uoregon.edu/: https://dibels.uoregon.edu/

Reading instruction grouping for students with reading difficulties. *Remedial and Special Education, 24*, 301-315.


Appendix A

Parent/Guardian Cover Letter and Consent Forms
Dear Parent/Guardian:

I am a doctoral candidate at the University of Toledo. My program requires performing a research project. I would like your permission to include (name) in my study at the specialized school.

I am investigating a teaching technique with students who have reading difficulties. My goal is to help (name) increase his/her reading abilities. I will be giving a reading test to (name) both before and after tutoring him/her. I will be using a multisensory approach to teaching reading. This is a type of teaching that uses visual, auditory, and tactile ways of learning.

During the study, the classroom procedures will continue as usual. The study will be conducted in the library or room 1316. (name) will work with me, one-to-one, in the library or room 1316 two or more times a week for approximately 30 minutes per lesson.

The information collected will only be used for this study. (name)’s name will not be used in any reports. Achievement test scores will be used from (name)’s permanent school records for purpose of comparison only, and (name)’s identity will remain anonymous. Each lesson will be audio-recorded in order to assure my adherence to my lesson plan. The teachers at the specialized school recommended (name) as a good candidate for my study.

The study will be conducted for approximately three months. (name)’s participation in this study is completely voluntary, and you may withdraw (name) at any point during the study, without penalty.

Enclosed please find the –Parent/Guardian Consent Form.” If you have any questions regarding the study, please leave a message for Breck Davis at (419) 303-7736.

Sincerely,

Breck Davis, Orton-Gillingham Reading Instructor
Ph.D. Candidate, University of Toledo
Richard Welsch, PhD  
Early Childhood, Physical and Special Education, Interim Chair  
Faculty Advisor, University of Toledo
PARENT/GUARDIAN - INFORMED CONSENT FORM

The Effects of an Orton-Gillingham-based Reading Program for Students with Emotional/behavior Problems

Principal Investigator: Richard Welsch, PhD, Associate Prof/Interim Chair, 419.530.7736
Breck Davis, Doctoral Candidate, 419.530.2468

Purpose: Your son/daughter is invited to participate in the research project entitled, The Effects of an Orton-Gillingham-based Reading Program for Students with Emotional/behavior Problems, which is being conducted at the University of Toledo under the direction of Dr. Richard Welsch. The purpose of this study is to increase your student’s reading skills by teaching with a multisensory approach.

Description of Procedures: This research will take place in the specialized school from now until the end of the school year. Your student will receive individual tutoring in reading 2-4 times a week. The tutoring sessions will last approximately 30 minutes and be conducted in the school library or Room 1316. Tutoring sessions will focus on learning phonics and decoding skills. The teaching strategies will use visual, auditory, and tactile ways of learning. Each lesson will be audio recorded in order to assure the researcher’s adherence to the lesson plan. Additionally, the audio recording will help document your students’ reading performance. If your student does not participate in this study, he/she would be in a regular classroom not receiving any one-to-one attention. Please check below and initial.

Permission to record: Will you permit the researcher to audio record during the tutoring sessions?
YES [ ] NO [ ] [ ] Initial Here

After your son/daughter has completed the tutoring, the research team will debrief you about the data, theory and research area under study and answer any questions you may have about the research.
**Potential Risks:** There are minimal risks to participation in this study, including loss of confidentiality.

The students may become frustrated or agitated during the reading intervention, but the teacher will provide positive praise to help the student with their reading difficulties. Overall there is little to no chance that any harmful psychological or emotional feelings will be experienced.

**Potential Benefits:** The direct benefit to your son/daughter if they participate in this research may be that you will learn about how the Orton Gilligham-based Reading Program helps the student learn new reading skills. Students are likely to benefit from the intervention as it will increase their ability to understand the alphabetic code and become better readers. Researching teaching methods is important to discover the most efficient approach for different type of students. Others may benefit by learning about the results of this research.

**Confidentiality:** The researchers will make every effort to prevent anyone who is not on the research team from knowing that your son/daughter participated in this research, or what the results are. The consent forms with signatures will be kept separate from responses, which will not include names and which will be presented to others only when combined with other responses. Although we will make every effort to protect your confidentiality, there is a low risk that this might be breached.

**Voluntary Participation:** Your refusal to have your son/daughter participate in this study will involve no penalty or loss of benefits to which you are otherwise entitled and will not affect your relationship with The University of Toledo or the services received through the specialized school. In addition, you may discontinue participation at any time without any penalty or loss of benefits.

**Contact Information:** Before you decide to accept this invitation for your student to take part in this study, you may ask any questions that you might have. If you have any questions at any time before, during or after the tutoring sessions you should contact a member of the research team. Dr. Richard Welsch can be researched at 419.530.7736 or at richard.welsch@utoledo.edu. Additionally, Beck Davis can be reached at 419.530.2468. If you have questions beyond those answered by the research team or your rights as a research subject or research-related injuries, please feel free to contact Dr. Jeffrey Busch, research compliance coordinator at (419) 530-2844, or the Chairperson of the SBE Institutional Review Board, Dr. Barbara Chesney, in the Office of Research on the main campus at (419) 530-2844.

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

**SIGNATURE SECTION – Please read carefully**

You are making a decision whether or not to participate in this research study. Your signature indicates that you have read the information provided above, you have had all your questions answered, and you have decided to take part in this research.
The date you sign this document to enroll in this study, that is, today's date must fall between the dates indicated at the bottom of the page.

Name of Student (please print)

Name of Parent/Guardian (please print)   Signature   Date

Name of Person Obtaining Consent   Signature   Date

THE UNIVERSITY OF TOLEDO
SOCIAL, BEHAVIORAL & EDUCATIONAL INSTITUTIONAL REVIEW BOARD

The research project described in this consent form and the form itself have been reviewed and approved by the University of Toledo Social, Behavioral & Educational Review Board (SBE IRB) for the period of time specified below.

SBE IRB #: ___________________________   Approved Number of Human Subjects: ______

Project Start Date: ___________________________   Project Expiration Date: ___________________________

Date: ___________________________

Barbara Chesney, Ph.D., Chair
UT Social Behavioral & Educational IRB
Appendix B

Student Consent Form
CHILD RESEARCH SUBJECT ASSENT FORM

The Effects of an Orton Gillingham-based Reading Program for Students with Emotional/behavior Problems

Principal Investigator: Richard Welsch, PhD, Associate Prof/Interim Chair, 419.530.7736
Breck Davis, Doctoral Candidate, 419.530.2468

- You are being asked to be in a study to help understand people better.
- You should ask any questions you may have before making up your mind. You can think about it and discuss it with your family before deciding.
- It is okay to say “No” if you don’t want to be in the study. If you say “Yes” you can change your mind and then quit the study at any time without getting in trouble.

We are doing this research study to find out more about teaching reading. We want this research study to be educational as well as fun. A research study is a good way to find out about how people learn. If you decide that you want to be part of this study, you will be asked to meet with me twice a week for 45 minutes. We will work together one-on-one for approximately 45 minutes practicing your reading skills. During this time you will be able to earn rewards and at the end of each session we will talk about our session and you can choose a game or something fun to do. We will work one-on-one in the school Buffet or the Recreation Room.

Learning to be a good reader takes a lot of hard work and practice. My only request of you is that you be on your best behavior and try your best. Not everyone who takes part in this study will benefit. A benefit means that something good will come out of our tutoring. We think these benefits might include becoming a better a reader.

When we are finished with this study we will write a report about what was learned. This report will not include your name or say that you were in the study.

If you have any questions about the study, you can ask Mr. Breck Davis. You can call the investigators listed at the top of this page if you have a question later.

If you decide to be in this study, please print and sign your name below.
I, ____________________________, want to be in this research study.
(Print your name here)

Sign your Name: ____________________________ Date: _______________
Appendix C

Researcher’s Weekly Schedule

<table>
<thead>
<tr>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30</td>
<td>Student D</td>
<td>Student A</td>
<td>Student D</td>
</tr>
<tr>
<td>Student A</td>
<td>Student D</td>
<td>Student A</td>
<td>Student D</td>
</tr>
<tr>
<td>11:15 – 12:30</td>
<td>Notes and Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:30</td>
<td>Student B</td>
<td>Student C</td>
<td>Student B</td>
</tr>
<tr>
<td>Student C</td>
<td>Student B</td>
<td>Student C</td>
<td>Student B</td>
</tr>
</tbody>
</table>
Appendix D

10-Point Daily Probes
### Set 1 m, f, a, t, b, i, h, j, k, p

<table>
<thead>
<tr>
<th>List one</th>
<th>List two</th>
<th>List three</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. am</td>
<td>1. tap</td>
<td>1. fit</td>
</tr>
<tr>
<td>2. mat</td>
<td>2. hat</td>
<td>2. tab</td>
</tr>
<tr>
<td>3. it</td>
<td>3. fib</td>
<td>3. at</td>
</tr>
<tr>
<td>4. jam</td>
<td>4. jib</td>
<td>4. pit</td>
</tr>
<tr>
<td>5. kit</td>
<td>5. tip</td>
<td>5. bam</td>
</tr>
<tr>
<td>6. if</td>
<td>6. bit</td>
<td>6. bib</td>
</tr>
<tr>
<td>7. pat</td>
<td>7. hip</td>
<td>7. fat</td>
</tr>
<tr>
<td>8. hit</td>
<td>8. bat</td>
<td>8. jab</td>
</tr>
<tr>
<td>9. him</td>
<td>9. tat</td>
<td>9. kip</td>
</tr>
<tr>
<td>10. jab</td>
<td>10. map</td>
<td>10. ham</td>
</tr>
</tbody>
</table>

### Set 2 r, l, n, o, e, u, d, c, g, s

<table>
<thead>
<tr>
<th>List one</th>
<th>List two</th>
<th>List three</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. run</td>
<td>1. cub</td>
<td>1. fog</td>
</tr>
<tr>
<td>2. bed</td>
<td>2. ran</td>
<td>2. cup</td>
</tr>
<tr>
<td>3. log</td>
<td>3. bud</td>
<td>3. lip</td>
</tr>
<tr>
<td>4. man</td>
<td>4. lid</td>
<td>4. nit</td>
</tr>
<tr>
<td>5. sit</td>
<td>5. rat</td>
<td>5. dip</td>
</tr>
<tr>
<td>6. rug</td>
<td>6. bin</td>
<td>6. job</td>
</tr>
<tr>
<td>7. cud</td>
<td>7. let</td>
<td>7. pad</td>
</tr>
<tr>
<td>8. rod</td>
<td>8. gun</td>
<td>8. rub</td>
</tr>
<tr>
<td>9. led</td>
<td>9. sat</td>
<td>9. jet</td>
</tr>
<tr>
<td>10. dug</td>
<td>10. lap</td>
<td>10. sin</td>
</tr>
</tbody>
</table>

### Set 3 v, w, y, z, x, th, ch, sh, wh

<table>
<thead>
<tr>
<th>List one</th>
<th>List two</th>
<th>List three</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. with</td>
<td>1. think</td>
<td>1. sash</td>
</tr>
<tr>
<td>2. thin</td>
<td>2. smash</td>
<td>2. chunk</td>
</tr>
<tr>
<td>3. zip</td>
<td>3. chop</td>
<td>3. shin</td>
</tr>
<tr>
<td>4. yes</td>
<td>4. wet</td>
<td>4. zap</td>
</tr>
<tr>
<td>5. whit</td>
<td>5. whip</td>
<td>5. yam</td>
</tr>
<tr>
<td>6. van</td>
<td>6. shut</td>
<td>6. vat</td>
</tr>
<tr>
<td>7. fox</td>
<td>7. zit</td>
<td>7. path</td>
</tr>
<tr>
<td>8. ship</td>
<td>8. yet</td>
<td>8. wig</td>
</tr>
<tr>
<td>9. chin</td>
<td>9. ax</td>
<td>9. fox</td>
</tr>
<tr>
<td>10. box</td>
<td>10. vet</td>
<td>10. when</td>
</tr>
</tbody>
</table>
Set 4 -ft, -st, -lt, -pt, -ct, -xt, -mp,

<table>
<thead>
<tr>
<th>List one</th>
<th>List two</th>
<th>List three</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. swift</td>
<td>1. rapt</td>
<td>1. left</td>
</tr>
<tr>
<td>2. last</td>
<td>2. fist</td>
<td>2. pact</td>
</tr>
<tr>
<td>3. kept</td>
<td>3. next</td>
<td>3. duct</td>
</tr>
<tr>
<td>4. jump</td>
<td>4. act</td>
<td>4. silt</td>
</tr>
<tr>
<td>5. text</td>
<td>5. felt</td>
<td>5. cast</td>
</tr>
<tr>
<td>6. melt</td>
<td>6. pump</td>
<td>6. wimp</td>
</tr>
<tr>
<td>7. bump</td>
<td>7. wilt</td>
<td>7. next</td>
</tr>
<tr>
<td>8. shift</td>
<td>8. fast</td>
<td>8. insect</td>
</tr>
<tr>
<td>9. chimp</td>
<td>9. kilt</td>
<td>9. thump</td>
</tr>
<tr>
<td>10. fact</td>
<td>10. gift</td>
<td>10. apt</td>
</tr>
</tbody>
</table>

Set 5 -lp, -lf, -lk, -nt, -nd, -sk, -sp 7

<table>
<thead>
<tr>
<th>List one</th>
<th>List two</th>
<th>List three</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. milk</td>
<td>1. self</td>
<td>1. left</td>
</tr>
<tr>
<td>2. ask</td>
<td>2. bent</td>
<td>2. husk</td>
</tr>
<tr>
<td>3. shunt</td>
<td>3. risk</td>
<td>3. shelf</td>
</tr>
<tr>
<td>4. kelp</td>
<td>4. welt</td>
<td>4. walk</td>
</tr>
<tr>
<td>5. task</td>
<td>5. help</td>
<td>5. asp</td>
</tr>
<tr>
<td>6. ant</td>
<td>6. elf</td>
<td>6. tent</td>
</tr>
<tr>
<td>7. hunt</td>
<td>7. band</td>
<td>7. help</td>
</tr>
<tr>
<td>8. hand</td>
<td>8. rasp</td>
<td>8. talk</td>
</tr>
<tr>
<td>9. gasp</td>
<td>9. silk</td>
<td>9. runt</td>
</tr>
<tr>
<td>10. mask</td>
<td>10. bunt</td>
<td>10. end</td>
</tr>
</tbody>
</table>

Set 6  blends L, S, R, W

<table>
<thead>
<tr>
<th>List one</th>
<th>List two</th>
<th>List three</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. blink</td>
<td>1. crash</td>
<td>1. clasp</td>
</tr>
<tr>
<td>2. slip</td>
<td>2. glad</td>
<td>2. slab</td>
</tr>
<tr>
<td>3. plan</td>
<td>3. grasp</td>
<td>3. stub</td>
</tr>
<tr>
<td>4. twit</td>
<td>4. brag</td>
<td>4. brat</td>
</tr>
<tr>
<td>5. blend</td>
<td>5. skull</td>
<td>5. trash</td>
</tr>
<tr>
<td>6. clash</td>
<td>6. blimp</td>
<td>6. swim</td>
</tr>
<tr>
<td>7. crab</td>
<td>7. clam</td>
<td>7. skim</td>
</tr>
<tr>
<td>8. drag</td>
<td>8. flag</td>
<td>8. smug</td>
</tr>
<tr>
<td>9. flap</td>
<td>9. slash</td>
<td>9. scab</td>
</tr>
<tr>
<td>10. swift</td>
<td>10. swat</td>
<td>10. skin</td>
</tr>
</tbody>
</table>
Set 7  Vowels (long)  Magic “E”

<table>
<thead>
<tr>
<th>List one</th>
<th>List two</th>
<th>List Three</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Snake</td>
<td>1. cube</td>
<td>1. fume</td>
</tr>
<tr>
<td>2. delete</td>
<td>2. Spike</td>
<td>2. extreme</td>
</tr>
<tr>
<td>3. like</td>
<td>3. Eve</td>
<td>3. crate</td>
</tr>
<tr>
<td>4. game</td>
<td>4. make</td>
<td>4. rope</td>
</tr>
<tr>
<td>5. prone</td>
<td>5. hope</td>
<td>5. wake</td>
</tr>
<tr>
<td>6. bake</td>
<td>6. blaze</td>
<td>6. pride</td>
</tr>
<tr>
<td>7. resume</td>
<td>7. tube</td>
<td>7. shade</td>
</tr>
<tr>
<td>8. fine</td>
<td>8. broke</td>
<td>8. blade</td>
</tr>
<tr>
<td>9. bone</td>
<td>9. glide</td>
<td>9. chime</td>
</tr>
<tr>
<td>10. tone</td>
<td>10. grape</td>
<td>10. crave</td>
</tr>
</tbody>
</table>

Set 8 Misc digraphs  _v as a Vowel, ph, qu, ck soft c & g

<table>
<thead>
<tr>
<th>List one</th>
<th>List two</th>
<th>List three</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. dry</td>
<td>1. jack</td>
<td>1. place</td>
</tr>
<tr>
<td>2. back</td>
<td>2. graph</td>
<td>2. happy</td>
</tr>
<tr>
<td>3. these</td>
<td>3. fly</td>
<td>3. resume</td>
</tr>
<tr>
<td>4. ginger</td>
<td>4. phony</td>
<td>4. gem</td>
</tr>
<tr>
<td>5. city</td>
<td>5. cry</td>
<td>5. dice</td>
</tr>
<tr>
<td>6. quack</td>
<td>6. page</td>
<td>6. gym</td>
</tr>
<tr>
<td>7. change</td>
<td>7. ice</td>
<td>7. quit</td>
</tr>
<tr>
<td>8. phone</td>
<td>8. quite</td>
<td>8. gypsy</td>
</tr>
<tr>
<td>9. tube</td>
<td>9. plume</td>
<td>9. trick</td>
</tr>
<tr>
<td>10. race</td>
<td>10. fuse</td>
<td>10. try</td>
</tr>
</tbody>
</table>

Set 9 Vowel Digraphs long _ai ay ee ea oa ow oe

<table>
<thead>
<tr>
<th>List One</th>
<th>List Two</th>
<th>List Three</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  nail</td>
<td>1  jail</td>
<td>1  rail</td>
</tr>
<tr>
<td>2  creak</td>
<td>2  seat</td>
<td>2  play</td>
</tr>
<tr>
<td>3  rail</td>
<td>3  cheat</td>
<td>3  snow</td>
</tr>
<tr>
<td>4  tow</td>
<td>4  crow</td>
<td>4  eat</td>
</tr>
<tr>
<td>5  steam</td>
<td>5  heap</td>
<td>5  show</td>
</tr>
<tr>
<td>6  road</td>
<td>6  toad</td>
<td>6  goat</td>
</tr>
<tr>
<td>7  toe</td>
<td>7  toe</td>
<td>7  aloe</td>
</tr>
<tr>
<td>8  week</td>
<td>8  sheep</td>
<td>8  ray</td>
</tr>
<tr>
<td>9  stray</td>
<td>9  tray</td>
<td>9  pail</td>
</tr>
<tr>
<td>10 hail</td>
<td>10 pain</td>
<td>10 feet</td>
</tr>
</tbody>
</table>
Appendix E

Student Behavior Record Sheet

Student Behavior Scale
Date:___________________

Name______________  Score:_________________

<table>
<thead>
<tr>
<th>Drills</th>
<th>Comments</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auditory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blending</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesson/Review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral Reading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>probe (+2 )</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total/20

Daily Score

<table>
<thead>
<tr>
<th>Score</th>
<th>Reward Description</th>
<th>Rewards</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Respecting all classroom expectations</td>
<td>3 choices from any Treasure Chest</td>
</tr>
<tr>
<td>2</td>
<td>Good effort/some problems</td>
<td>2 choices from any Treasure Chest</td>
</tr>
<tr>
<td>1</td>
<td>Disruptive Behavior</td>
<td>1 choice from any Treasure Chest</td>
</tr>
<tr>
<td>0</td>
<td>Major Problems</td>
<td>No Picks</td>
</tr>
</tbody>
</table>
Appendix F

Daily Point Accumulation Record

Student Name: ____________________________
Student Signature: ________________________

Daily Point Accumulation

80 POINTS REQUIRED

BIG SURPRISE PRIZE

<table>
<thead>
<tr>
<th>Date</th>
<th>Daily Points/20 per day</th>
<th>Running Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix G

The Urban School Behavior Scale and Operational Definitions

3 Respecting all classroom expectations
2 Good effort/some problems
1 Disruptive Behavior
0 Major Problems

The Urban School Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Operational Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>In/out of area</td>
<td>The student does not wander around the classroom or hallway.</td>
</tr>
<tr>
<td>E2</td>
<td>Raising hand to speak</td>
<td>The student raises his hand if he has a question or would like to add to the discussion.</td>
</tr>
<tr>
<td>E3</td>
<td>Appropriate language, gesture, voice tone-volume</td>
<td>The student does not punch, kick, yell or threaten teachers or classmates, or use inappropriate gestures; does not engage in arguments with classmates or teachers. The student speaks with a non-threatening, quiet, respectful voice.</td>
</tr>
<tr>
<td>E4</td>
<td>Hands/feet/belongings to self</td>
<td>The student does not physically touch, pinch, poke, punch or push teachers or classmates.</td>
</tr>
<tr>
<td>E5</td>
<td>Following directions</td>
<td>The student responds to the teacher's requests and actively participates in the lesson.</td>
</tr>
<tr>
<td>E6</td>
<td>Respect for others or their property</td>
<td>The student uses supplies as they are designed. Does not run, throw, or poke others with school supplies. The student uses objects in the classroom appropriately. Does not stand on chairs or desks or throw pens, pencils or other school supplies. The student does not steal, break, deface or damage property.</td>
</tr>
<tr>
<td>E7</td>
<td>Ignoring Others Problem Behavior</td>
<td>The student ignores classmates’ negative behavior and lets the teacher handle the problem. The student keeps to himself focusing on his own work and not worrying about what classmates are doing.</td>
</tr>
</tbody>
</table>
Appendix H

Teacher Questionnaire
Teacher Post-Intervention Questionnaire

1. I am familiar with a multisensory approach to teaching reading.
   a. Strongly disagree
   b. Disagree
   c. Neither disagree nor agree
   d. Agree
   e. Strongly agree

2. I am familiar with the Orton-Gillingham approach to teaching reading.
   a. Strongly disagree
   b. Disagree
   c. Neither disagree nor agree
   d. Agree
   e. Strongly agree

3. Have you ever used a multisensory approach when teaching?
   a. Yes
   b. No

4. The points system helps to reduce students’ disruptive behaviors.
   a. Strongly disagree
   b. Disagree
   c. Neither disagree nor agree
   d. Agree
   e. Strongly agree

5. The student’s academic skills improved after the intervention.
   a. Strongly disagree
   b. Disagree
   c. Neither disagree nor agree
   d. Agree
   e. Strongly agree
6. The student’s behavior improved after working with the researcher.
   a. Strongly disagree
   b. Disagree
   c. Neither disagree nor agree
   d. Agree
   e. Strongly agree

7. It was beneficial for the student to work with the researcher.
   a. Strongly disagree
   b. Disagree
   c. Neither disagree nor agree
   d. Agree
   e. Strongly agree

8. I believe this technique should be used with students at the specialized school.
   a. Strongly disagree
   b. Disagree
   c. Neither disagree nor agree
   d. Agree
   e. Strongly agree

9. The Orton-Gillingham method is an effective way to work with students with E/BD.
   a. Strongly disagree
   b. Disagree
   c. Neither disagree nor agree
   d. Agree
   e. Strongly agree

10. The student’s behavior improved during the intervention.
    a. Strongly disagree
    b. Disagree
    c. Neither disagree nor agree
    d. Agree
    e. Strongly agree
11. Do you believe the student benefited from the reading intervention? Yes/No? Explain.
   What types of improvements did you observe?
12. Did you notice any changes in the student's behavior? Yes/No? Explain.
13. Does the student seem more confident to you? Explain.
14. Does the student seem to get along better with you and his classmates? Explain.
Appendix I

Student Questionnaire
**Student Questionnaire:** *All responses will be recorded using an audiorecorder.*

1. My reading has improved after working with the researcher.
   a. Yes
   b. No
   c. Stayed the same

2. I enjoyed working with the researcher.
   a. Yes
   b. No
   c. Stayed the same

3. It is easier for me to sound out words after working with the researcher.
   a. Yes
   b. No
   c. Stayed the same

4. I feel more confident that I can do well in school after working with the researcher.
   a. Yes
   b. No
   c. Stayed the same

5. I would like to continue working on my reading using this method.
   a. Yes
   b. No
   c. Stayed the same

6. I am more confident in my reading skills.
   a. Yes
   b. No
   c. Stayed the same

7. This was a fun way for me to practice my reading skills.
   a. Yes
   b. No
   c. Stayed the same

8. I would like to continue working with a tutor on my reading skills using this teaching method.
   a. Yes
   b. No
   c. Stayed the same

9. I found the work hard to do.
   a. Yes
10. I believe working with the researcher was a positive experience.
   a. Yes
   b. No
   c. Stayed the same

11. I was bored when working with the researcher.
   a. Yes
   b. No
   c. Stayed the same

12. When working with the researcher, which activity did you like the best and why?
   a. Visual drill
   b. Auditory drill
   c. Blending drill
   d. Oral reading

13. What did you like best about working with the researcher?

14. What did you dislike about working with the researcher?
Procedural Checklist

Student’s Name: ________________________  Session # _______________
Observer: ______________________________  Date:  __________________

**Visual drill**

1. Did the researcher have the student review known grapheme flashcards?
   - Yes___  No___
2. Did the researcher make sure the student pronounced the graphemes correctly?
   - Yes___  No___
3. Did the researcher provide positive feedback throughout the drill?
   - Yes___  No___
4. If the student made a mistake,
   a. Did the researcher ask the student to trace the grapheme on the card or in the sand three times while saying the correct sound out loud?
      - Yes___  No___  N/A___
   b. If the student could not come up with the correct phoneme after tracing or writing the grapheme in the sand, did the researcher provide the student with the correct phoneme?
      - Yes___  No___  N/A___

**Auditory drill**

5. Did the researcher have the student look at his mouth while he said each phoneme?
   - Yes___  No___
6. Did the researcher have the student repeat the phoneme back to him before writing it in the sand?
   - Yes___  No___
7. Did the researcher have the student write each of the graphemes for the phonemes in the sand?
   - Yes___  No___
8. Did the researcher have the student say the grapheme name and sound out loud then underline it in the sand?

   Yes___  No___

9. Did the researcher provide positive feedback throughout this drill?

   Yes___  No___

**Blending drill**

10. Did the researcher have the student line up each of the grapheme flashcards into three different stacks?

    Yes___  No___

11. Did the researcher make sure the student put the vowel flashcards in the middle stack?

    Yes___  No___

12. Did the researcher ask the student to point to each grapheme, moving from left to right saying it's phoneme out loud before blending them together?

    Yes___  No___

13. Did the researcher provide positive feedback throughout the drill?

    Yes___  No___

14. If the student made a mistake,

   a. Did the researcher ask the student to write the grapheme in the sand or on the dry erase board three times before moving on?

      Yes___  No___  N/A___

   b. Did the researcher provide the correct phoneme if the student could not come up with it?

      Yes___  No___  N/A___

**Skill Lesson or Introduction of new letters**

15. Did the researcher read a list of words out loud (auditory) and have the student repeat them?

    Yes___  No___

16. Did the researcher ask probing questions related to the new skill or lesson?

    Yes___  No___
17. Did the researcher have the student identify any similarities or differences between the words?

   Yes___    No___

18. Did the researcher have the student perform a visual drill?

   Yes___    No___

19. Did the researcher have the student perform an auditory drill?

   Yes___    No___

20. Did the researcher have the student perform a tactile/kinesthetic drill?

   Yes___    No___

21. Did the researcher have the student review the lesson?

   Yes___    No___

22. Did the researcher provide positive feedback during the lesson?

   Yes___    No___

**Oral Reading**

23. Did the researcher have the student follow along with a pointer or their finger while reading?

   Yes___    No___

24. Did the researcher provide prompts when necessary?

   Yes___    No___

25. Did the researcher identify unknown sight words for the student when necessary?

   Yes___    No___

26. Did the researcher ask comprehension questions?

   Yes___    No___

27. Did the researcher provide positive feedback?

   Yes___    No___

**Probe Cards**

28. Did the researcher provide a 10-word probe from the student’s current set list?

   Yes___    No___

29. If the student got caught on a word for more than 3 seconds, did the researcher tell the student to move on to the next card?

   Yes___    No___    N/A___
Appendix K

DIBELS Benchmarks

First Grade: Three Assessment Periods Per Year

| DIBELS Measure | Beginning of Year  
|                | Months 1 - 3  
|                | Scores | Status  
|                | Middle of Year  
|                | Months 4 - 6  
|                | Scores | Status  
|                | End of Year  
|                | Months 7 - 10  
|                | Scores | Status  
| LNF            | 0 - 24  
|                | 25 - 36  
|                | 37 and above  
|                | At Risk  
|                | Some Risk  
|                | Low Risk  
|                | Not administered during this assessment period.  
|                | Not administered during this assessment period.  
| PSF            | 0 - 9  
|                | 10 - 34  
|                | 35 and above  
|                | Deficit  
|                | Emerging  
|                | Established  
|                | 0 - 9  
|                | 10 - 34  
|                | 35 and above  
|                | Deficit  
|                | Emerging  
|                | Established  
| NWF-CLS        | 0 - 12  
|                | 13 - 23  
|                | 24 and above  
|                | At Risk  
|                | Some Risk  
|                | Low Risk  
|                | 0 - 29  
|                | 30 - 49  
|                | 50 and above  
|                | Deficit  
|                | Emerging  
|                | Established  
| ORF            | Not administered during this assessment period.  
|                | 0 - 7  
|                | 8 - 19  
|                | 20 and above  
|                | At Risk  
|                | Some Risk  
|                | Low Risk  
| RTF            | Not administered during this assessment period.  
| WUF            | BENCHMARK GOALS FOR THIS MEASURE HAVE NOT YET BEEN ESTABLISHED.  
|                | Tentatively, students in the lowest 20 percent of a school district using local norms should be considered at risk for poor language and reading outcomes, and those between the 20th percentile and 40th percentile should be considered at some risk.  

https://dibels.uoregon.edu/benchmark