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Videotaped Oral Reading Fluency Lab: An Alternative Approach To One-on-one Interventions For Intermediate Elementary Students With Learning Disabilities

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VIDEOTAPED ORAL READING FLUENCY LAB: AN ALTERNATIVE APPROACH TO ONE-ON-ONE INTERVENTIONS FOR INTERMEDIATE ELEMENTARY STUDENTS WITH LEARNING DISABILITIES

by

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ABSTRACT

The ability to read aloud fluently is a reflection of one's ability to automatically decode words and comprehend text at the same time (Samuels, 2006), a task which may be difficult for many intermediate elementary students with learning disabilities (LD) (Ferrara, 2005). Previous research shows that audio-assisted repeated readings and goal-setting with feedback are effective methods of improving oral reading fluency (ORF) (Chard, Vaughn, & Tyler, 2002; Morgan & Sideridis, 2006; Therrien, 2004) but implementing these interventions may be time-consuming for teachers and tedious for students.

The purpose of this research was to determine the impact of including repeated reading interventions within a problem-solving framework of services for individual intermediate students with LD. Specifically, this study investigated whether a videotaped delivery method of a repeated reading intervention improved ORF at the same rate as a one-on-one delivery method for four fifth-grade students with LD. Using an ABCBC alternating-phases design, the single-subject study began with a short baseline followed by two treatment phases. Phase B utilized one-on-one repeated reading interventions delivered by an experienced teacher. Phase C utilized a pre-recorded videotaped version of the same teacher following the same procedures. Both quantitative and qualitative data were analyzed to determine the preferred learning method for each participant.

The results of this research reinforced the use of repeated reading interventions for individual intermediate elementary students with LD. All four participants met or exceeded the goal of 25% improvement in reading rates. Results also suggest value in devoting time to the preparation of prerecorded videotaped ORF interventions in order to meet the needs of some

struggling learners. Consideration of individual learner characteristics was discussed, as well as consideration of time constraints faced by both general and special educators.

Dedicated to my family.

To my husband, Eric, my very best friend who loves me the way I am, always and forever.

To my children, Jason, Rachel, and Michael, who bring me joy.

To my parents, Ken and Liz, who personify unconditional love.

To my extended family, especially Fred and Nancy, who have supported me and believed in me.

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We are a community of learners. As a first-year teacher many years ago I prominently displayed that statement across the front of my classroom. From that day forward I have been surrounded by an amazing community of learners. I begin by acknowledging the most important members of that community, the students whom I have been privileged to serve over the course of my career, and most particularly the four young people who served as the participants in this study.

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THE PROBLEM AND ITS CLARIFYING COMPONENTS

Introduction

The ability to read aloud fluently is a reflection of one's ability to automatically decode words and comprehend text at the same time (Samuels, 2006). Therefore, measurements of oral reading fluency are regarded as critically important indicators of how well an individual is reading (Fuchs, Fuchs, Hosp, & Jenkins, 2001; National Institute of Child Health and Human Development [NICHHD], 2000). Fluent readers connect text with accuracy and expression at an appropriate rate of speed (NICHHD, 2000; Rasinski, 2003). Non-fluent readers, also referred to as disfluent readers, use a laborious word-by-word pattern that is very inefficient, thereby taxing cognitive resources and impeding comprehension (Jenkins, Fuchs, van den Broek, Espin, & Deno, 2003).

Intermediate elementary students with learning disabilities (LD) may demonstrate an inability to fluently read aloud grade level text (Ferrara, 2005). Students with LD who are at the fifth-grade level and continue to exhibit oral reading fluency deficits have most likely been exposed to several years of classroom oral reading exercises. Their fluency deficits are usually quite obvious to their classroom peers, parents, and both general and special education teachers (Archer, Gleason, & Vachon, 2003; Jenkins et al., 2003). By the time disfluent students with LD have reached the intermediate elementary grades, their lack of progress has, in many cases, led to poor self-perception of their ability to read (Bauminger, Edelsztein, & Morash, 2005; Fuchs, Fuchs, Mathes, & Martinez, 2002), which, in turn, impacts their enjoyment of reading, as well as the amount of time they engage in reading, both silently and orally. In a very real sense, oral

reading fluency becomes the gatekeeper to positive reading outcomes for many students with LD (Archer et al., 2003).

Need for the Study

Intervening on behalf of students who are disfluent while they are still in elementary school is essential in order to avoid the negative impact the deficit can have on reading comprehension (Carnine & Carnine, 2004; Laberge & Samuels, 1974; O'Connor et al., 2001; Rasinski, Blachowicz, & Lems, 2006; Stanovich, 1980). By fifth grade, the expectation is for students to have already progressed from learning how to read to using their reading skills as a tool to learn content knowledge (Chall & Jacobs, 2003). This shift in emphasis can have a devastating effect on science, mathematics, and history knowledge acquisition for a student with LD who struggles with oral reading fluency (Carnine & Carnine; National Joint Committee on Learning Disabilities [NJCLD], 2008).

Fortunately, oral reading fluency deficits can be improved through the use of scientific, research-based practices, such as listening and audio-assisted repeated reading, combined with goal setting plus performance feedback (Chard, Vaughn, & Tyler, 2002; Morgan & Sideridis, 2006; Therrien, 2004). While these interventions have proven to be effective, their implementation is time-consuming for teachers, and oftentimes tedious for students.

Background

Policy and practices in the field of elementary school reading have undergone many changes over the past 30 years in response to extensive growth in the quantity of scientifically based reading research (Denton, Vaughn, & Fletcher, 2003; McMaster, Fuchs, Fuchs, &

Compton, 2005). Research conducted on how the brain processes the information required to become a proficient reader has greatly expanded our knowledge of how to best help students who struggle while learning to read (Denton et al., 2003; Shaywitz, Lyon, & Shaywitz, 2006; Spear-Swerling, 2007). Although scientists and researchers nationwide have produced an abundance of studies on best practices in reading instruction, the persistent issue of bringing research to scale has impeded full implementation of these results in classrooms (Fuchs & Fuchs, 2001; Greenwood & Abbott, 2001; Spear-Swerling, 2007).

In an effort to bridge the research-to-practice gap, the National Reading Panel (NRP) issued a comprehensive report on reading research, identifying five essential components of reading instruction: phonemic awareness, phonics, vocabulary, comprehension, and fluency (NICHHD, 2000). Subsequently, the No Child Left Behind Act (NCLB) (U.S. Public Law 107-110, 2002) required that reading programs must address the use of research-based practices while teaching these five components in order to receive federal funding. Provisions were made by NCLB to track adequate yearly progress (AYP) of students' reading performance across subgroups, including the subgroup of students with disabilities.

The rights of students with disabilities and their families are protected in the United States by the Individuals with Disabilities Education Act (IDEA, 2004). This federal legislation stipulates that students with disabilities should be provided an Individual Education Program (IEP) and receive special education services in the least restrictive environment. When IDEA was reauthorized in 2004, it provided closer alignment with NCLB and continued to promote inclusive practices for serving students with disabilities.

Identification of Learning Disabilities

The reauthorization of IDEA opened the door for a new process of identifying students with LD using a problem-solving approach referred to as Response to Intervention (RTI). The need for this new identification process continues to be debated primarily due to concerns about the growing number of students in this disability category. Chief amongst these concerns has been over-identification of low socio-economic and minority students (Hosp & Reschly, 2004; Skiba et al., 2008), overall increased numbers of referrals to special education (Harry & Klingner, 2007), and an enormous increase in the number of evidence-based studies on the remediation of deficit skills, particularly in the field of reading research (Chard, et al., 2008). These indicators all pointed toward the need for a new systemic approach.

Universal screening for all students in the primary grades is one key element of RTI. In RTI, rather than waiting for a student to demonstrate academic difficulties in the classroom and then leaving it up to the general educator's discretion to make a referral for screening, educators administer brief assessments designed to reveal students who are at risk and in need of supplemental instruction. The results of screening assessments should aid the interventionist in diagnosing when a student needs remediation on specific skills. Continuous progress monitoring with instruments such as curriculum-based measurements (CBMs) are then conducted throughout the year with varying frequency according to individual needs. One commonly-used CBM is the number of words a student can correctly read aloud in one minute when given a grade level passage, also referred to as the oral reading fluency (ORF) score.

As acceptance for the RTI framework for identification becomes more widespread, local education agencies are exercising a new degree of flexibility in deciding how they will each

operationally define a reading learning disability within the parameters of the federal definition and guidelines for processes (Machek & Nelson, 2007). In the state of Florida, RTI has been introduced as a general education initiative, rather than solely a special education process of identification, in order to promote universal acceptance and foster collaborative efforts among departments toward improving academic outcomes for all students (Sawyer, Holland, & Detgen, 2008). The Florida framework for RTI combines the elements of ongoing professional development, quality instruction for all students, and assessment into a multi-tiered approach that gradually increases the intensity of instruction for students who are struggling. Data obtained from CBMs, including ORF scores, assist in planning for remediation. Students who do not respond to remediation that is implemented with fidelity in smaller group settings, including one-on-one sessions, may then be identified as potentially at risk for LD. Procedural safeguards as well as alternative methods of identification also remain in place.

By definition, RTI programs must include direct, explicit instructional methods in order to provide the necessary data for identification of those students who fail to respond (Mellard, 2008). Scientifically based oral reading fluency interventions, such as listening and audio-assisted repeated reading combined with goal setting plus performance feedback (Chard, Vaughn, & Tyler, 2002; Morgan & Sideridis, 2006; Therrien, 2004), are one example of what a quality RTI intervention entails.

Characteristics of Intermediate Students with Learning Disabilities

Learner characteristics must be taken into account when designing an effective literacy program for students with LD (NJCLD, 2008). The close connection between pronounced

problems with reading and negative attitudes toward reading, as well as low motivation to persist in practicing toward improvement of skills is well-documented (Chapman, Tunmer, & Prochnow, 2000; Morgan & Fuchs, 2007; Quirk & Schwanenflugel, 2004).

Generally, intermediate students with LD may have low self-esteem, low self-concept, and a strong desire for social acceptance by peers without disabilities (Tarver-Behring & Spagna, 2004), all factors that can significantly impede literacy skill acquisition. Common characteristics of all students of this age, both disabled and non-disabled, include a lack of organizational skills, a desire for independence and self-expression, and a resistance to developing personal relationships with adults (NJCLD, 2008), such as the type of relationships required in daily reading interventions.

One-on-One Interventions

In a problem-solving approach to identifying students with LD, students receive interventions within a framework of increasing intensity. Those who do not respond to whole-group instruction have supplemental small-group intervention periods added to their school day. If after a period of time they continue to be resistant to learning in a small group setting, then an even smaller group or one-on-one instruction is added to their day. This one-on-one maximum intensity instruction may be provided by the general education teacher, the special education teacher, a reading specialist, a paraprofessional, an instructional assistant, or perhaps even a trained volunteer.

Not all students respond in the same way to the same best practices, even when they are administered intensively in a one-on-one situation (Dion, Morgan, Fuchs, and Fuchs, 2004;

Vaughn et al., 2009; Welsch, 2007). When one takes into consideration what is known about the characteristics of intermediate students with LD, it stands to reason that some students would find one-on-one interventions to be at odds with their desire for independence and social acceptance within their inclusive classrooms. The interventionist in a one-on-one setting must, therefore, be mindful of the importance of establishing a positive relationship with the student in order to foster improved academic outcomes. Intermediate students with LD may not have an awareness of exactly what their reading deficits are (NJCLD, 2008) and, in a quest for independent learning, they may actually resist the efforts of a well-meaning interventionist.

Videotaped Interventions

In a videotaped intervention, the desired behavior or skill is demonstrated through a video representation of what that behavior or skill should look like (Bellini & Akullian, 2007). This video model allows a learner to imitate and generalize the targeted skill (Hitchcock, Prater, & Dowrick, 2004; McCoy & Hermansen, 2007). Considering the previously discussed characteristics of intermediate students with LD (NJCLD, 2008), depersonalization of instruction through the use of a videotaped interventionist may actually be a learner-preferred method of delivery. A student who self-progresses through the required repetitive steps of a videotaped oral reading fluency intervention may actually experience a degree of ownership in their learning, which will help offset the tedious nature of the repetitious activity (Hasselbring & Goin, 2004).

Since videotaped interventions may be prerecorded; their use provides some flexibility for busy educators. Teachers could select appropriate materials at a variety of readability levels, prerecord many passages, and label them according to the reading level of the text. When a

student requires ORF interventions, the teacher would select from this digital library to match reader to text. Prerecorded interventions may be used again and again over the years to come, thus providing significant savings in both time and cost. Additionally, during valuable instructional time a teacher may be working with other students while a student who requires ORF interventions is practicing with a computer-based model and recording his or her own assessment for a teacher to listen to and score during non-instructional time. Videotaped ORF interventions could be shared across settings in general education classrooms, special education resource rooms, computer labs, and even used at home with portable media devices or through access to a school website.

Statement of the Problem

Reading research conducted over the past 30 years has consistently supported the use of listening and audio-assisted repeated reading as well as goal-setting and progress monitoring to improve the oral reading fluency rate and accuracy of disfluent students (Chard et al., 2002; Morgan & Sideridis, 2006; Therrien, 2004). Those students who are reading below grade level norms should be served on a daily basis in progressively smaller group sessions at first, and those who do not respond to small group interventions should then receive one-on-one interventions. The challenge lies in finding a method of implementation of these strategies that meets the immediate needs of both the learner and the time-constrained teacher who may have many students who require remediation (Nelson, Alber, & Gordy, 2004).

Elementary school teachers of today are faced with a growing number of demands upon their time even as their daily schedule becomes more and more regulated by federal and state

mandates on how their time is spent (Center on Education Policy, 2008). In schools across the nation, problem-solving programs are now in place that set aside a portion of valuable instructional time each day in order to intervene on behalf of struggling students. These skill-based interventions must be systematic, intensive, and immediate, and they should be delivered by skilled personnel only to those students who have been previously identified as deficient in that skill (Vaughn & Fuchs, 2003). At issue is the identification of who takes on the role of the interventionist (Deshler, 2005). Should it be the general educator, the special educator, or both? Unfortunately, in this era of economic downturn, many of today's schools have been forced to scale back on available personnel, leading to increased student-teacher ratios and further complicating the issue of demands upon teachers' time. In schools where many students are struggling to progress, teachers may be required to rely on paraprofessionals, instructional assistants, or even trained volunteers to deliver interventions.

The quality of the teacher is one of the most important determinants of student success (Berry, Hoke, & Hirsch, 2004; Blair, Rupley, & Nichols, 2007). Students with learning disabilities rely on effective teaching practices implemented with fidelity in order to positively affect their learning outcomes (Darling-Hammond & Berry, 2006, Lose, 2008; McEneaney, Lose, & Schwartz, 2006). It is critical that teaching practices utilized during reading intervention sessions are not only research-based but also model effective implementation of the desired skill (Denton et al., 2003), while addressing the individual learner characteristics. The choice of interventionist, therefore, is paramount to the success of intensive interventions when these sessions are a part of the identification process for special education services. If the interventionist employed during the stages of pre-referral actions is anyone less than a qualified,

effective teacher of reading, then the accuracy of the identification process will be undermined (Kamil et al., 2008). Thus, the dilemma lies in finding ways to match the availability of the qualified teacher to the individual needs of struggling students.

An additional concern when attempting to specifically impact oral reading fluency rates is the tedious nature of repeated readings in light of the general characteristics of intermediate students with LD (NJCLD, 2008). Students at this age may be unmotivated and self-conscious about participating in interventions, particularly when progress is slow and the procedure is inherently repetitive. The effectiveness of the intervention may well be affected by the method of delivery. As in any student-centered instruction, educators must consider that what works best for one student may not be true for all students (Dion et al., 2004; Vaughn et al., 2009; Welsch, 2007). Maintaining flexibility in providing alternative settings, different interventionists, and/or a variety of research-based practices within the framework of a problem-solving approach is critical to providing data essential for special education referral (NJCLD, 2005). Yet this flexibility is increasingly difficult for site-based educators to attain.

Purpose of the Study

The purpose of this study was to determine the impact of repeated reading interventions for individual intermediate students with learning disabilities. Specifically, this study investigated whether a videotaped delivery method of a repeated reading intervention improved oral reading fluency at the same rate as a one-on-one delivery method. Four fifth-grade students with LD participated in two alternating phases. One phase utilized one-on-one repeated reading

interventions conducted in person by a highly qualified teacher. The other phase utilized a pre-recorded videotaped version of the same teacher following the same procedures.

Definitions of Terms

Curriculum-Based Measurements (CBMs) of Reading – Curriculum-based measurements of reading are repeated measures of reading performance used to monitor progress within particular curricula (Deno, 1985; Wagner, McComas, Bollman, & Holton, 2006;). These measurements are proven to be valid and reliable indicators of reading ability (Fuchs & Fuchs, 2002). In this study, the dependent variables are curriculum-based measurements of oral reading fluency rate and accuracy taken when the participants read aloud passages derived from their Harcourt Science curriculum, referred to as grade level passage #2.

Easier Level Passages – Easier level passages are written at a readability level that is below the grade level of the reader and used for practicing ORF. In this study the easier level passages were all measured as somewhere between third and fourth-grade level and were referred to as easier level passage #1.

Flesch-Kincaid – A tool available in Microsoft Word documents which will measure the readability of a passage based on the vocabulary and complexity of sentences in the passage.

Grade Level Passages – Grade level passages are written at a readability level that is the same as the grade level of the reader. In this study, grade level passages were all measured as within a fifth-grade readability level, as were referred to as grade level passage #2.

Inclusive Instruction – Inclusive instruction means that all children with disabilities have the right to access a free appropriate public education in the least restrictive environment possible

(FL DOE, 2005). Whenever possible, students with LD should be included and receive instruction alongside their non-disabled peers in the general education classroom with the use of supplementary aids and services provided according to each student's Individual Education Program (IDEA, 2004). The participants in this study received the majority of their instruction in an inclusive general education classroom setting.

Instructional and Non-Instructional Time – Instructional time is the time a teacher spends with students involved in teaching activities. Non-instructional time is the time a teacher spends in other job-related activities, such as planning, faculty meetings, or parent-teacher conferences.

Lexile Measure – Lexile measure is a computer-based assessment of a student's reading ability, which can be used to match students with text written at the appropriate readability level (Fry, 2002; Lennon & Burdick, 2004). In this study, the Lexile measure is used as one of the criteria for participant selection in order to exclude any participants who would find the passages used as instruments too difficult or too easy.

One-on-One Interventions – For the purposes of this study, a one-on-one intervention always refers to one adult teacher modeling the desired skill while just one student observes and responds.

Oral Reading Fluency (ORF) – A fluent reader is one who reads connected text with accuracy and expression at an appropriate rate of speed (NICHHD, 2000). Non-fluent readers, also referred to as disfluent readers, read using a laborious word-by-word pattern that is very inefficient (Rasinski, 2003).

Readability – Readability of text refers to the application of a formula that takes into consideration items, such as vocabulary and complexity of sentences, in order to measure how

difficult it is to read the text (Fry, 2002). This objective readability score is used to match text to the skill level of the reader and is often expressed in terms of an approximate grade level. For the purpose of this study, the passages used for practice and measurement of oral reading fluency were measured for readability using the Flesch-Kincaid grade level scale available as a tool in Microsoft Word documents.

Research-Based Interventions – According to the No Child Left Behind Act (U.S. Public Law 107-110, 2002), an intervention is research-based when it:

(i) employs systematic, empirical methods;
(ii) involves rigorous data analyses;
(iii) uses valid and reliable measurements or methods across multiple occasions; and
(iv) is approved by a peer-reviewed group using rigorous, objective review (20 U.SD 6368; Burns, Jacob, & Wagner, 2007).

Resource Room Instruction – Resource room instruction is when small groups of students with disabilities who have similar needs receive intensive instruction designed to target particular skill deficits. Resource room instruction occurs outside of the general education classroom and may even be delivered one-on-one. In such situations, a special education teacher or reading specialist may provide services in an alternate setting, referred to in this study as a resource room. The interventions described in this study were delivered in a resource room setting.

Specific Learning Disability (LD) – A specific learning disability is defined in the Florida State Board of Education Rules as follows (Rule 6A-6.03018):

> (1) Definition. A specific learning disability is defined as a disorder in one or more of the basic learning processes involved in understanding or in using language, spoken or written, that may manifest in significant difficulties affecting the ability to listen, speak, read, write, spell, or do mathematics. Associated conditions may include, but are not limited to, dyslexia, dyscalculia, dysgraphia, or developmental aphasia. A specific learning disability does not include learning problems that are primarily the result of a visual, hearing, motor, intellectual, or emotional/behavioral disability, limited

English proficiency, or environmental, cultural, or economic factors. (Florida DOE, 2009).

Videotaped Interventions – For the purposes of this study, a videotaped intervention always refers to a session in which just one student observes and responds to a prerecorded videotaped model of the desired skill.

Research Questions

The specific research questions to be addressed are:

1. When individual fifth-grade students with learning disabilities receive repeated oral reading interventions, to what degree, if any, does the number of words read correctly per minute increase?
2. Does a one-on-one delivery method or a videotaped delivery method lead to more rapid increases in oral reading fluency measurements for individual fifth-grade students with learning disabilities?
    a. To what degree, if any, does the number of words read correctly per minute increase for the participants while using each approach?
    b. To what degree, if any, does the number of words read incorrectly decrease while using each approach?
3. Which approach, one-on-one or videotaped, do the participants prefer?

Research Design

The research questions were addressed by using a single-subject, ABCBC alternating-phases design. Quality indicators for rigorous single-subject research (Horner et al., 2005) were

considered, including vigilant attention to detail in order to address potential threats to validity. Studies must meet these criteria if their results are going to contribute to the eventual identification of evidence-based practices (Horner et al., 2005), which is an ultimate goal of the study described herein.

Dependent Variables

The two dependent variables were the grade level passage #2 reading rate and reading accuracy curriculum-based measurements (CBMs) taken during every intervention session. The reading rate was the number of words read correctly in one minute (WCPM) when reading aloud a passage that was at grade level readability (fifth-grade) for the participants. A word was counted as read correctly if it was pronounced correctly as used within the context of the sentence, and any self-corrections made within three seconds were considered to be correct. The reading accuracy measurement was the number of words read incorrectly, or errors per minute (EPM), on the same passage. Errors included any word mispronounced within the context of the sentence, word omissions, words read out of order, and word substitutions that were not corrected within three seconds. If any words were omitted, including entire lines of text, or read out of order, each word not read correctly was counted as an error. All of the CBMs were audio-recorded and checked for reliability in scoring by a trained independent observer at least 33% of the time.

Independent Variables

The independent variables were the videotaped versions of the intervention and the one-on-one versions of the intervention, both of which featured the same interventionist following the

same research-based procedures for improving ORF. In single-subject research, fidelity of implementing the independent variables must be established (Horner et al., 2005), and in this study, fidelity was established by having the same interventionist in all phases following a scripted procedure for the intervention in all phases. Additionally, an independent trained observer conducted fidelity checks on at least 33% of the sessions. During these checks, the observer watched carefully for adherence to the prescribed procedures on the part of both the interventionist and the participants.

Significance of the Study

The significance of the study was to contribute to the body of empirical research on best practices for intervening on behalf of intermediate students with LD who read below grade level norms for ORF. If the videotaped delivery method demonstrated improvement in measurements of ORF at the same rate or more rapidly than the one-on-one delivery method for these four students, then a larger-scale analysis of the effectiveness of teacher-created videotaped repeated reading interventions would be warranted (Horner et al., 2005).

CHAPTER 2
REVIEW OF THE LITERATURE AND RESEARCH

Introduction

Policy and practices in the field of reading have evolved over the past 30 years in response to extensive growth in the quantity of scientifically-based reading research (Denton, Vaughn, & Fletcher, 2003; McMaster, Fuchs, Fuchs, & Compton, 2005). Increased knowledge of how the brain processes the information required to become a proficient reader has greatly expanded our understanding of how to best help students who struggle while learning to read (Denton et al., 2003; Spear-Swerling, 2007). Acquisition of this knowledge has subsequently led to a vast increase in the number of evidence-based studies on the remediation of deficit reading skills (Chard et al., 2008).

According to the National Center for Educational Statistics, about 34% of fourth-grade students in the United States, and 30% of the students in the state of Florida, are not proficient enough to read grade level text at a basic level of understanding or better (Lee, Grigg, & Donahue, 2008). Results of the 2007 National Assessment of Educational Progress reading assessment, given nationwide to a representative sample of 35,000 fourth and eighth-grade students, indicated that reading scores overall had increased (Lee, Grigg, & Donahue). Yet the percentage of students at or above proficiency level remains dismal. Since a literate workforce is a universal American expectation, early prevention of reading difficulties has become an enormous societal concern (Al Otaiba, Kosanovich-Grek, Torgesen, Hassler, & Wahl, 2005). Therefore, studies conducted with the purpose of broadening our knowledge of instructional

practices in the field of reading remediation are socially valid endeavors (Chard, Ketterlin-Geller, Baker, Doabler, & Apichatabutra, 2009; Horner et al., 2005).

In response to a request from Congress, the National Reading Panel (NRP) was formed in 1997 and charged with the duty of studying the enormous base of reading research and making recommendations on how to implement the best practices in classrooms across our nation. This task of compiling data with the goal of increasing the use of research-based practices was assumed by a panel of fourteen scientists, reading experts, and parents. The committee began by establishing what constitutes rigorous methodological standards for research and then used these standards to screen 100,000 research studies (International Reading Association [IRA], 2002). Based on the research, the NRP identified five essential components of reading instruction: phonemic awareness, phonics, vocabulary, fluency, and comprehension. Their culminating work, the National Reading Panel Report, was the most comprehensive national report on scientific reading research ever produced (NICHHD, 2000).

When the No Child Left Behind Act (NCLB) was signed into law in 2001, it established the Reading First program. The purpose of Reading First was to provide for implementation of the recommendations set forth in the NRP Report, including intensive professional development for teachers aimed at reducing the gap between literacy research and practice (Lane et al., 2009). Among other things, NCLB mandated that schools use research-based reading practices to address the five essential components of reading, including reading fluency, in order to receive federal funding (U.S. Public Law 107-110, 2002).

The reauthorization of the Individuals with Disabilities in Education Improvement Act (IDEA, 2004) also impacted reading policy and practices in the United States. The Individuals

with Disabilities in Education Act has always protected the rights of children with disabilities and their families and requires an Individual Education Program (IEP) for each child receiving special education services. The IEP document must state the extent to which a child will be included in a general education classroom receiving services alongside non-disabled peers. This policy of inclusion has meant that general educators and special educators must work closely together to support the needs of their struggling students with learning disabilities (Tarver-Behring & Spagna, 2004), and the 2004 revision extends that purpose to include the pre-referral period as well. The 2004 revision of IDEA was intended to more closely align with the provisions of NCLB, including the directive that school districts may now use up to 15% of their IDEA funds for pre-referral services to assist students who are struggling but not yet identified as having a learning disability.

The following literature review was conducted for the purpose of making a connection between known research-based practices for improving ORF for students with specific learning disabilities (LD) and the needs of both intermediate elementary students with LD and their teachers. Consideration will be given to the identification and characteristics of intermediate elementary students with LD, the history and current best practices for improving oral reading fluency, the use of curriculum-based measurements for fluency assessment, effective teachers' applications of research through interventions, and two specific models for delivery of instruction, one-on-one and videotaped. The intent behind this review is to establish a foundation for providing videotaped repeated reading interventions for intermediate elementary students with LD who read below grade level norms for ORF.

Specific Learning Disabilities

Definition and Prevalence

Over six million students, ages 6 through 21, receive special education services in the United States. In the state of Florida, special education services are provided to about 350,000 students ages 6 through 21, equating to just over 10% of the general population. Specific learning disabilities (LD) are the largest disability category of this age of students and, in the state of Florida, students with LD represent about 51% of all students with disabilities (U. S. Dept. of Ed., 2006).

A specific learning disability is defined in the Florida State Board of Education Rules as follows (Rule 6A-6.03018):

> (1) Definition. A specific learning disability is defined as a disorder in one or more of the basic learning processes involved in understanding or in using language, spoken or written, that may manifest in significant difficulties affecting the ability to listen, speak, read, write, spell, or do mathematics. Associated conditions may include, but are not limited to, dyslexia, dyscalculia, dysgraphia, or developmental aphasia. A specific learning disability does not include learning problems that are primarily the result of a visual, hearing, motor, intellectual, or emotional/behavioral disability, limited English proficiency, or environmental, cultural, or economic factors. (Florida DOE, 2009).

It is estimated that 80% of students with LD have reading difficulties (Lerner, 1989). Improving reading outcomes for students with LD through the process of conducting scientific research has required immense effort on behalf of researchers, and is, in fact, the impetus for this review.

Identification

Discrepancy Model

In the United States, the most widely used method of identifying LD is to measure the discrepancy between a student's IQ and his or her academic achievement (Fletcher, Francis, Morris, & Lyon, 2005). The appropriateness of the discrepancy model for identification has been controversial (Speece, Case, & Molloy, 2003) since the instruments used have led to overrepresentation of certain cultural, racial, gender, and socio-economic groups in special education (Hosp & Reschly, 2004; Skiba et al., 2008) as well as increased numbers of referrals to special education (Harry & Klingner, 2007).

The President's Commission on Excellence in Special Education (PCESE, 2002) recommended the use of an RTI problem-solving approach for identifying students as LD. The panel of educators, parents, and advocates who made up this commission agreed that RTI reduces bias and more accurately discriminates between students with true disabilities and those who may be just temporarily resistant to interventions or developmentally delayed in reading. Since IDEA subsequently acknowledged the use of RTI (IDEA, 2004), movement has begun toward increased use of RTI and less reliance on the sole use of the discrepancy model for identifying students with LD.

The need for evidence-based assessment of LD in children and adolescents was reported by Fletcher, Francis, Morris, and Lyon (2005). They studied the reliability and validity of four different models, including response to intervention (RTI), discrepancy, low achievement, and intra-individual differences. Their findings indicated that RTI models show the most promise for

accurate assessment when combined with aspects of the low achievement models, but RTI should not be the sole instrument for diagnoses of LD. However, they do stress that under no circumstances should an identification of LD occur without some measure of the student's response to research-based interventions.

Response to Intervention

Response to intervention (RTI) is defined by the National Association of State Directors of Special Education (NASDSE) as the practice of providing high quality instruction and interventions matched to student need, monitoring progress frequently to make decisions about changes in instruction or goals, and applying student response data to important educational decisions (NASDSE, 2008). The National Research Center on Learning Disabilities (NRCLD) identified eight core components of a quality RTI program. Those components are high quality classroom instruction, research-based instruction, consideration of classroom performance, universal screening, research-based interventions, continuous progress monitoring, progress monitoring during interventions, and fidelity measures (Mellard, 2008). Response to intervention is not a prescriptive program; rather, it is a framework for a process of implementing a multi-tiered approach to prevention and early intervention (Chard et al., 2008; Hall, 2008).

One common RTI framework, including the one used in Florida, is a three-tiered approach in which the foundation for success is established at the first tier when all students receive a core curriculum of evidence-based reading instruction delivered with fidelity for at least 90 minutes each day (Sawyer et al., 2008). Instruction within the general education classroom is provided by a certified teacher(s), at times assisted by support personnel, utilizing

research-based practices to cover the five components of reading identified in the NRP report, including direct instruction in reading fluency. Quality instruction is delivered throughout each school on a class-wide basis in an effort to eliminate poor teaching as a cause of inadequate response to instruction (Daly, Martens, Barnett, Witt, & Olson, 2007; Roberts, Torgesen, Boardman, & Scammacca, 2008). Within tier one, all students are universally screened for any difficulties in demonstrating academic progress within the core curriculum (Davis, Lindo, & Compton, 2007). Student progress within tier one is continuously monitored to provide data to assist in identifying those students who respond to instruction and those who do not (Torgesen, 2002). Measurements of ORF are routinely used as one of the progress monitors.

The second tier, for those students who fail to demonstrate grade level proficiency on key reading measures taught and assessed within tier one, is a supplemental daily time period spent in small group instruction of three to five students. By definition, intervention sessions within RTI programs should include direct, explicit instructional methods combined with feedback in order to provide the necessary data for identification of those students who fail to respond (Council for Exceptional Children, 2007; Denton, Fletcher, Anthony, & Francis, 2006). Participants in tier two interventions should have their progress, including progress in reading fluency, closely monitored to assist teachers in differentiating between the responders and non-responders to intervention (Chard et al., 2008; Vaughn et al., 2009). The primary focus of tier two sessions is on prevention of reading difficulties which may evolve into a reading disability (Davis et al., 2007; Torgesen, 2002). According to Vaughn and Roberts (2007) 20% to 30% of students will need to participate in this type of supplemental instruction.

The third tier is for those learners for whom the data indicate a lack of progress toward remediation of skill deficits after participating in small group interventions offered in tier two. Tier three participants are in need of more intensive reading instruction. which may occur with greater frequency and/or for longer periods of time than tier two interventions and may even occur in a one-on-one setting (Denton et al., 2006).

The change to a new model of assessment and instruction has been complicated and the full implementation of RTI may well take years to achieve (Fuchs & Deshler, 2007). Proponents of RTI argue that the overriding emphasis on data-driven instructional decisions, which is the hallmark of RTI, should lead to a more accurate distinction between students who struggle because of poor instruction, lack of motivation, lack of parental support, or a host of other reasons and those who truly struggle due to learning disabilities (Vaughn, Linan-Thompson, & Hickman, 2003). Critics, however, remain concerned about the legal and ethical issues surrounding diagnosis of a child with LD based on a method that remains in need of additional research (Burns et al., 2008).

While the IQ-achievement discrepancy model may be fraught with controversy, the process of RTI also has its share of criticism. VanDerHayden, Witt, and Gilbertson (2007) in their report on the implementation of an RTI program at five elementary schools condemn the lack of research to date on entire RTI systems. They report that no universal model for implementation of RTI has been established; therefore, states are currently implementing individual plans for assessment, a process that mirrors the procedures followed at the inception of the discrepancy model. An additional criticism of RTI research is the overwhelming focus on early identification of students with special needs. Interventions at the intermediate and

secondary levels are most definitely challenging but not impossible (Denton & Vaughn, 2008; Deshler, 2005), so studies conducted with rigor must be encouraged at this level as well.

Previous RTI studies have indicated the need for further research into designing effective tier two and tier three interventions, which will provide quality data to assist in the diagnoses of students with special needs (Fuchs, Mock, Morgan, & Young, 2003; Speece & Walker, 2007). The intervention described in this study has the potential to be utilized specifically within an RTI framework, or any problem-solving model, as a set of procedures to follow when attempting to positively impact the ORF rates of disfluent intermediate elementary students.

Inclusive Models of Instruction

Inclusive instruction occurs when students with disabilities are afforded equal educational opportunities to that of their non-disabled peers (Pugach & Blanton, 2009). According to the Education for all Handicapped Children Act (EAHCA), individuals with disabilities in the United States have been assured the right to a free appropriate public education in the least restrictive environment since 1975 (EAHCA, 1975). In 2004, just over half of the nation's students (52.1%) between the ages of six and twenty-one identified as LD were included in a regular education classroom for most of their school day (U. S. Dept. of Education, 2006). While there remains some controversy over whether or not full-day inclusion provides the optimum model for meeting the academic and social needs of students with LD (Vaughn, Elbaum, & Boardman, 2001; Wiener & Tardif, 2004), research supports the perspective that students with mild disabilities, including LD, should spend most of their day in a general educational setting alongside peers who are non-disabled (McLeskey, Hoppey, Williamson, & Rentz, 2004).

Furthermore, research consistently indicates mutual benefits for both disabled and non-disabled students who experience inclusive models of instruction (Staub, 1994; Vaughn, Elbaum, & Schumm, 1996).

The implementation of RTI in schools requires a previously unparalleled intensity of multidisciplinary collaboration between administrators, general educators, special educators, and related personnel who must coordinate efforts to develop inclusive models of intervention for students who are unsuccessful in meeting grade level standards (Hall, 2008; Vaughn & Roberts, 2007). General and special educators alike who teach in inclusive content-area classrooms must be prepared to meet the needs of extremely diverse groups of students (Lamar-Dukes & Dukes, 2005; Raphael & Au, 2005). Differentiating instruction across multiple skill levels can be challenging, and the effectiveness of instruction relies heavily on accurate assessment of student needs (Wagner et al., 2006) coupled with intensive, immediate interventions delivered in response to the results of those assessments (Fuchs, Fuchs, & Zumeta, 2008).

To demonstrate just how large the range of classroom abilities may be, one study measured the differences between skilled readers and students with LD (Jenkins et al., 2003). The results of this study of 109 fourth-grade students indicated that skilled readers as a group read words in context three times faster than readers with LD. The skilled readers also outperformed those less skilled by reading words in lists twice as fast. Clearly the lack of fluency oftentimes demonstrated by students with LD is one of the definitive reasons why adolescent students with LD may struggle to keep up with same-age peers in inclusive content area classrooms (Carnine & Carnine, 2004).

Learner Characteristics

In 2008, the National Joint Committee on Learning Disabilities (NJCLD) issued a position paper outlining what current literature shows will help meet the literacy needs of adolescent students with LD (NJCLD, 2008). Within their definition of adolescents they included students who are fourth-grade through 12th-grade, a range that encompasses the participants in this study and is considered to be a typical description of the age of adolescents. The committee found learner characteristics to be one of the contributing factors that must be taken into consideration when designing an effective literacy program for adolescents with LD. According to the NJCLD report; "Adolescents with LD often have persistent receptive and expressive oral language deficits that become more pronounced as (literacy) demands increase" (NJCLD, 2008, p. 4). These literacy problems, in turn, negatively affect the attitudes, motivation, and persistence of adolescents with LD, all of which are necessary attributes in order to achieve grade level standards for success. Students with LD also exhibit little awareness of their own specific strengths and weaknesses and do not usually advocate for accommodations that could help them succeed (NJCLD, 2008).

In a general sense, intermediate elementary students with LD have learned to compensate for their disability in their life outside of school, although maintaining this adaptive functioning does require a degree of dependence on both parents and teachers (Tarver-Behring & Spagna, 2004). Students with LD oftentimes have a poorly defined self-concept (Elbaum, 2002), so teachers must design interventions that provide opportunities to realize some degree of successful academic outcomes, thus encouraging the student's ability to adapt. Unfortunately, rather than feeling supported, many students with LD at this age report feelings of alienation

from teachers (Triplett, 2007). Consequently, adaptive functioning of an intermediate elementary student with LD could be at risk if negative perceptions of teachers' support persist into middle school.

Forgan and Vaughn (2000) conducted a longitudinal study of 14 Hispanic students both with (n=7) and without (n=7) LD. Their purpose was to examine the differences in how these two groups fared both socially and academically in the transition from the same inclusive elementary school classroom with consultation services to typical middle school classrooms. Findings indicated that overall social scores of both groups were relatively stable on measurements of self-concept and quality of friendships (e.g. peer support). Qualitative analysis of the data allowed the authors to surmise that positive experiences in extracurricular activities may have played a part in helping the students with LD adapt and maintain their average global self-concept. Additionally, mean academic gains in reading increased only slightly for both groups, a finding the authors reported as somewhat unexpected (Forgan & Vaughn, 2000).

Pellitteri, Dealy, Fasano, and Kugler (2006) discuss the importance of addressing the emotional intelligence of adolescents with LD, since these students have most likely developed a sense of failure toward becoming a competent reader. Emotional intelligence, including perceptions of competence, can have profound effects on cognitive processing during attempts at challenging tasks. Therefore, teachers who want to positively impact the areas of cognitive processing required for the complexities of reading must create an emotionally positive instructional environment for adolescent learners with LD (Pellitteri et al., 2008). Regardless of whether reading interventions occur within a general education classroom setting or a resource room setting, progress toward academic goals will be limited if emotional needs of students with

LD are not considered when teachers plan for the implementation of the intervention (Carbo, 2007; Deshler, 2005).

Oral Reading Fluency

When public schools were first developed in the United States, a considerable amount of time each school day was spent reading orally. In subsequent years, the tide shifted, and an emphasis was placed on silent reading instruction (Rasinski, 2003). In 1974, LaBerge and Samuels reported on their research, which addressed the fluency component of reading (LaBerge, 1974). For many years after, fluency was called "the neglected reading goal" (Allington, 1983) in part because of the strong emphasis educators continued to place on the importance of direct instruction in decoding, attention to sight words, and use of comprehension strategies. We now know that a more balanced approach to reading instruction is best (Blair et al., 2007) and should include explicit instruction in all five elements of reading: phonological awareness, decoding, reading fluency, vocabulary, and comprehension (Dion, Morgan, Fuchs, & Fuchs, 2004; IRA, 2002).

Theory of Automaticity

LaBerge and Samuels described the theory of automaticity, indicating that a fluent reader has the ability to automatically decode words and comprehend text at the same time and then demonstrate that ability by reading aloud at an appropriate rate, with few errors and with expression (LaBerge & Samuels, 1974; Samuels, 2006). Since individuals have a limited amount of attention they can devote to any one task, readers who must dedicate too much attention to decoding words have fewer cognitive resources available for use of strategies that accelerate

comprehension (LaBerge & Samuels, 1974; Wolf & Katzir-Cohen, 2001). Subsequent studies have supported the theory of automaticity (Chard, Pikulski, & McDonagh, 2006; Perfetti, 1985; Sencibaugh, 2007; Stanovich, 1980); thus, measurements of ORF are now regarded as critically important indicators of how well an individual is reading (NICHHD, 2000; Kuhn & Stahl, 2000).

Research conducted by Perfetti (1985) expanded upon the theory of automaticity. Perfetti proposed a verbal efficiency theory, describing a continuum of reading skills in which lower level lexical skills, such as word identification, must be conducted with efficiency prior to attainment of fluent reading and ultimate reading comprehension. When lower level skills are not performed efficiently, cognitive resources available for higher order skills are compromised. Therefore, concentrated practice on the use of lower level skills should be implemented in order to promote progress in reading comprehension for students who struggle (Perfetti, 1985).

Impact of Word Recognition Deficits

Oral reading fluency deficits for students with LD can be traced to poor context-free word recognition (Jenkins et al., 2003). Indeed some researchers believe that an inability to recognize in print the words a student uses in oral language is the defining characteristic of students with reading LD (Torgesen, 2000). Therefore, direct instruction in word recognition skills, for instance key science vocabulary, is recommended for achieving fluent levels of reading for students with LD. Conversely, poor oral reading fluency rates at the end of elementary school may be the most obvious indicator of students who continue to struggle with word identification skills and should consequently be screened for potential LD (Torgesen, 2000).

Faulkner and Levy (1999) conducted a study of 48 fourth-grade students to determine the importance of word recognition when practicing ORF. While no participants were specifically identified as LD, two comparison groups were formed of 24 "good" readers and 24 "poor" readers based on their scores on the word identification subtest of the Wide Range Achievement Test. The researchers found that when conducting repeated reading exercises, the first thing that poor readers learn is word recognition. Additionally, findings indicated that it is not enough to practice word recognition out of context, and in fact, improved fluency requires repeated reading practice to include some message overlap between passages. They conclude that overlap of key vocabulary permits greater attention to be focused on the automatic processing of text (Faulkner & Levy, 1999).

Additional ORF studies support the use of word overlap as a technique that is demonstrated to aid in generalization of repeated reading effects on easier passages to more difficult grade level passages (Denton et al., 2003; Faulkner & Levy, 1994). Roberts et al. (2008) recommended that adolescent struggling readers practice repeated reading of passages with instructional target words embedded rather than practicing with passages that contain unfamiliar vocabulary. In the current study, some overlap of key vocabulary existed between easier passages #1 and grade level passages #2 in order to scaffold learning gains achieved through repeated reading practice to the grade level curriculum-based measurement.

Impact on Comprehension

The embarrassment and frustration inherent in not being able to read aloud fluently may cause students with LD to shut down and discontinue the practice of reading. Therefore,

practicing and improving ORF of intermediate students with LD is critical to opening a window of opportunity to positively impact other elements of reading, such as comprehension (Lane et al., 2009). As Stanovich (1986) reported in his description of the Matthew Effect, poor readers reach a level of frustration that causes them to fall further and further behind even as good readers gain skills that enable them to progress. Consequently, within an inclusive content-area classroom environment, such as the middle school classrooms that fifth-grade students will transition to in sixth-grade, the differences between students with and without reading LD become more evident with each passing year (NJCLD, 2008).

Research clearly indicates a high correlation between reading rate and reading comprehension (Ferrera, 2005; Fuchs, Fuchs, Hosp et al., 2001; Homan, Klesius, & Hite, 1993; Rasinski & Hoffman, 2003; Torgesen, Rashotte, & Alexander, 2001). Intervening on behalf of disfluent students while they are still in elementary school is essential in order to avoid the negative impact the deficit can have on reading comprehension and subsequent content knowledge acquisition (O'Connor et al., 2001; Carnine & Carnine, 2004). By fifth-grade, the expectation is for students to have already progressed from learning how to read to using their reading skills as a tool to learn content knowledge (Chall & Jacobs, 2003). This shift in emphasis can have a devastating effect on science, math, and history knowledge acquisition for a student with LD who struggles with ORF (Carnine & Carnine, 2004, NJCLD, 2008).

One of the many challenges to be faced by adolescent students with LD is the relatively high readability of science textbooks relative to students' own reading ability (Mastropieri, Scruggs, & Graetz, 2003). Since textbooks are the primary instructional resource utilized in secondary content-area classes (Lenz, Deshler, & Kissam, 2004; Okolo & Ferretti, 1996), this

content material presents an incredible obstacle for students with LD attempting to access general education curriculum.

Carnine and Carnine (2004) estimate that between 75-80% of students in some middle school science classrooms cannot read the assigned textbook. The authors specifically studied strategies that would promote the development of fluency of science text. They recommend repeated readings of informational text combined with the use of graphs to chart progress in WCPM rates. Key vocabulary should be pre-taught, and comprehension checks should be conducted before and after repeated readings.

Archer, Gleason, and Vachon (2003) also promote the use of strategy instruction aimed at increasing ORF in content-area classrooms. They suggest the use of visual aids in secondary content-area classrooms that remind students to practice reading strategies such as repeated reading with informational text.

Fortunately, studies have shown ORF deficits can be improved through the use of scientific research-based practices such as listening and audio-assisted repeated reading combined with goal setting plus performance feedback (Morgan & Sideridis, 2006; Therrien, 2004; Chard et al., 2002).

Repeated Reading

Samuels pioneered the use of repeated readings for fluency remediation (Herman, 1985). His research showed that fluency increases with repetition since repetition allows more time for information processing (Samuels, 2006). Repeated reading interventions can be expected to produce improvements in reading rate of 25% (Samuels, 1979) as well as overall improvements

in reading accuracy (Herman, 1985). Research conducted subsequent to Samuels found that skill improvements a reader makes when practicing fluency by rereading a single passage are also transferable to other texts (Homan et al., 1993; Rasinski, 1990; Therrien, 2004).

Chard et al. (2002) compared 24 different studies in a meta-analysis of research, which specifically addressed the fluency needs of elementary students with LD. Their findings supported the use of oral repeated reading as an effective fluency intervention and specifically noted that studies on the use of silent reading practice do not demonstrate evidence of effectiveness for improving ORF. They found strength in combining corrective feedback with repeated reading practice when the goal is to improve WCPM rates by targeting and reducing the rate of errors. Lastly, this analysis offered "strong support for the implementation of fluency-building activities for students with learning disabilities" (p. 404).

In another meta-analysis of 18 studies (which included students with and without disabilities) conducted by Therrien (2004), findings reinforced the value of repeated reading practice for improving ORF of students with LD. Results indicated that the optimal number of repetitions of reading should be three or four, and there appears to be no benefit to increasing this number. The implications of this finding are that there are potential benefits for intermediate students with LD who make a concerted effort to practice fluency with listening and repeated readings of passages at least three times. Additionally, this meta-analysis investigated the practices of combining other instructional components with a repeated reading program, revealing the effectiveness of providing the student with a cue that reflects the goal of the repeated reading, whether it be to focus on speed or comprehension (Therrien, 2004).

Welsch (2007) conducted a single-subject study on the use of experimental analysis to determine the best ORF intervention for four third- and fourth-grade students with LD. He used a variation of an alternating-phases design in which he briefly experimented with four different treatments for each participant: repeated reading, listening passage preview, repeated reading with easier material, and listening passage with easier materials. The treatment that demonstrated the greatest effect for each student was then administered to that student for an extended period of time, and CBMs were used to monitor individual progress. Three out of the four participants demonstrated greatest effects in response to repeated readings. Results indicated a functional relationship between the use of a brief experimental analysis and improvements in ORF, suggesting that within the construct of LD individual differences in the root cause of disfluency should be addressed (Welsch, 2007).

Repeated reading effects were also demonstrated in a study of 37 second- and fourth-grade struggling students with and without LD. O'Connor, White, and Swanson (2007) used an experimental design to study the effects of two different treatments: reading aloud continuously versus reading aloud repeated passages. The participants practiced with an adult listener for 15 minutes per session, three sessions per week, for 14 weeks. Results indicated no significant differences in the treatment conditions, but growth curve analysis showed significant increases in both fluency and comprehension for the treatment groups as compared to the control group.

Nelson, Alber, and Gordy (2004) used a single-subject multiple-baseline design to study the impact of repeated reading combined with systematic error correction on four second-grade students. Three students were identified as LD, with one student diagnosed with attention deficit/hyperactivity disorder. A total of 33 sessions were held over the course of 6 weeks in a

resource room setting. All four students increased their WCPM rates and decreased their error rates, lending further support to ORF interventions, which include repeated reading techniques. Methods used in the study were chosen on the basis of proven effectiveness combined with high perceptions of efficiency and feasibility for implementation by teachers.

Countless studies have been conducted that combine repeated reading with other treatments aimed at improving ORF of adolescent students with LD. Therrien, Wickstrom, and Jones (2006) investigated the impact of combining repeated reading with a question generation strategy. They acknowledged that previous studies favored repeated reading as a method of improving reading rate but were interested in examining ways to enhance the effect this would have on comprehension. A pre/post experimental design was used to study 30 students in grades four to eight, who were either identified as LD (n=16) or at risk for reading failure (n=14). Their findings, after four months of practice, supported earlier studies for the positive significant effect of repeated reading practice on reading rate. Likewise, the addition of the question generation strategy demonstrated positive effects on reading achievement (Therrien et al., 2006).

Audio-Assisted Reading

At about the same time that Samuels was developing his research on the use of repeated readings as a method for improving fluency, Chomsky demonstrated that by audio-taping children's stories and asking students to listen and read along, ORF could be improved (Chomsky, 1976). Her research led others to investigate and develop numerous forms of assisted reading that educators could use as fluency interventions for students with LD. Paired reading, echo reading, and neurological impress methods (Heckelman, 1969) have all demonstrated

success as fluency interventions. Paired reading involves a good reader sitting next to the student and both reading orally from the same passage. Echo reading is when the teacher reads aloud a line from the text and the student echoes the teacher's voice, providing practice in both rate and intonation. The procedure for neurological impress is to sit behind the student and read a passage out loud together while speaking into the student's dominant ear. The basic premise of all assisted reading methods is that a more experienced, fluent teacher can scaffold learning for a disfluent student by providing an audio model of the academic goal. As the use of technology to enhance and supplement learning has evolved, the eventual value of utilizing computer-based models has been realized (Chard et al., 2002; Kuhn & Stahl, 2001) and is, in fact, the foundation of this study.

Goal-Setting with Performance Feedback

Oral reading fluency deficits for intermediate elementary students with LD can lead to poor self-esteem due to the laborious pace of their oral reading in a classroom setting (Rasinski, 2003). The self-concept of struggling readers is an important element to address since students who have negative perceptions of their ability to read will not read as often as students whose self-concept with regard to reading is more positive and well-defined (Elbaum, 2002; O'Connor, White, & Swanson, 2007). As students with LD progress through elementary school, the gap then widens between the amount of practice good readers get and the amount of practice for poor readers.

One way to encourage students in their pursuit of improved fluency skills is to use the results of the ORF assessments to graph data on CBMs, including the use of an aim line

(Hasbrouck & Tindal, 2006). These graphs can be shared with students in order to provide a very concrete visual display of progress toward goals.

A third meta-analysis on repeated reading studies to be considered in this review of literature was conducted by Morgan and Sideridis (2006). The researchers compared 30 single-subject studies using a multilevel random coefficient modeling technique to examine both the slope and intercept of interventions to determine their relative effectiveness for students with LD. Results were studied across gender, placement, and grade level. Findings indicated that goal setting with feedback appears to be critically important for supporting the chosen type of intervention. For grades five through 12 two interventions which appear to be effective are (a) keywords and previewing and (b) listening and repeated reading (Morgan & Sideridis, 2006).

Elements of Research-Based Reading Interventions

In an RTI problem-solving process, students receive interventions within a framework of increasing intensity (Vaughn & Fuchs, 2003). Those who do not respond to tier one whole-group instruction have tier two small-group intervention periods added to their school day. If after a period of time they continue to be resistant to learning in a small group setting, then tier three smaller group or one-on-one instruction is also added to their day. The specific method of intervention employed with individual students at each tier must be grounded in the research on how to best remediate the deficit skill. Evidence supports the implementation of research-based reading interventions aimed at improving specific reading skills of elementary students, and in most cases, such interventions will lead to marked improvements in reading over time (Vaughn et al., 2009).

According to the No Child Left Behind Act (U.S. Public Law 107-110, 2002), an intervention is research-based when it:

(i) employs systematic, empirical methods;
(ii) involves rigorous data analyses;
(iii) uses valid and reliable measurements or methods across multiple occasions; and
(iv) is approved by a peer-reviewed group using rigorous, objective review (20 U.SD 6368; Burns, Jacob, & Wagner, 2007).

In 2007, the Center for Instruction conducted a meta-analysis on the effectiveness of reading interventions for adolescent struggling readers (Scammacca et al., 2007). A total of 31 studies representing 1,306 participants were included, and implications for practice when providing interventions for all elements of reading were discussed. Findings relevant to fluency research indicate that repeated reading interventions demonstrated a small effect size of 0.26 (n=4, 95%, CI=-.08, .61) with the implication that studies are needed on different intervention techniques in order to determine how to best remediate persistent disfluency in adolescent students with LD (Scammacca et al., 2007).

Curriculum-Based Measurements of Reading

Curriculum-based measurements (CBMs) of reading are repeated measures of reading performance used to monitor progress within particular curricula (Wagner et al., 2006; Deno, 1985). These measurements are proven to be valid and reliable indicators of reading ability (Fuchs, 2004; Fuchs & Fuchs, 2002; Hasbrouck & Tindal, 2006). Passages to be read are taken from classroom texts of comparable level of difficulty, so that individual student progress can be tracked over time and lack of student progress can be quickly assessed (Wagner et al.). The use

of CBMs of words-correct-per-minute (WCPM) counts is recommended for ORF measurements of rate and accuracy (Deno, 2003; Walker, Mokhtari, & Sargent, 2006).

Wayman, Wallace, Wiley, Ticha, and Espin (2007) conducted a synthesis of the literature on the use of CBMs. Their purpose was to determine whether CBMs demonstrate validity and reliability, and whether CBMs present a practical tool for use by practitioners. The researchers examined studies conducted specifically on the use of reading CBMs published since 1989. Findings supported the use of CBMs as practical tools for teachers to use to track student progress, but they caution against the misuse of such data when it becomes a part of high stakes testing with significant social consequences for students. A second finding indicates questionable validity for the use of reading CBMs with students younger or older than grades 2-5. In fact within the second-grade through fifth-grade range they discovered inconsistencies in growth patterns as the text difficulty increased, indicating questionable validity of slope measurements of growth. For instance, students at grade 2 appeared to progress at a more rapid rate than students at grade 5. The researchers also express concern about variability of data points around the slope and the ability of practitioners to evaluate slopes affected by extreme variability of a few points (Wayman et al., 2007).

Hasbrouck and Tindal (2006) published the normed results of WCPM data they collected in 1992 from students in grades 2-5 across eight geographic regions in the United States. This well-recognized table of norms became an invaluable tool for educators to use when making instructional decisions about students' reading progress. In 2006 Hasbrouck and Tindal published a revised table of norms, this time encompassing data collected from 2000-2004. Measurements on ORF of students in grades 1-8 from 23 states across all levels of reading,

including students diagnosed with LD, were compiled (Hasbrouck & Tindal, 2006). The updated 2006 table of ORF norms served as a reference point for the ORF interventions provided in the present study.

To determine whether or not a student has deficits in their ORF rates, teachers should use the following procedures for conducting CBMs. First, the student is given an unfamiliar passage and asked to read aloud while being timed for one minute. The teacher makes note of any errors including substitutions, omissions, and mispronunciations. These notes provide valuable data on specific deficits to target for individual student remediation. The text passage to be read aloud should be one that is written at the student's current grade level of difficulty (Fuchs & Deno, 1991; Stecker, Lembke, & Foegen, 2008). The resulting WCPM is then compared to established norms for the grade level in order to determine quartile placement of fluency rate for the student (Hasbrouck & Tindal, 2006). Frequent progress monitoring of a student's oral WCPM rate is recommended since these CBMs allow an educator to make data-driven instructional decisions, a practice which is supported by years of reading research (Dion et al., 2004; Stecker & Fuchs, 2000; Wayman et al., 2007).

Repeated reading exercises should be conducted utilizing text which is carefully matched to the reading ability of the participant (Rasinski, Blachowicz, & Lems, 2006; Samuels, 2006). Students who are reading below their assigned grade level will experience a sense of frustration which will hamper progress if they are asked to engage in repeated reading practice with grade level text (Rasinski, 2003). Research also supports the practice of allowing students to self-select practice materials from high-interest, appropriately-leveled passages (Carbo, 2007). A potential

limitation to self-selection however is the requirement that teachers maintain a collection of passages from which students at a variety of reading levels may choose.

Educators preparing materials to be used during intervention sessions aimed at increasing ORF must first determine a student's instructional reading level and provide practice text at that level (Rasinski, 2003). For the intermediate elementary student with LD, this instructional level may be well below their assigned grade level. To omit this essential accommodation would mean practicing at a frustration level, where progress would not be expected (Samuels, 2006). Determination of a student's reading level can be made by counting the errors made by the student during an oral reading of a passage that is one hundred words in length. A passage is said to be at an independent level when a student is correctly decoding the words in that passage at a rate of 96% or more. At this level, a student needs no assistance in reading. The optimum level for reading instruction is when the student has an error rate between 90-95%. At this level of text, the student can benefit from further intervention so this is referred to as the instructional level of reading. When a student's error rate causes them to correctly decode less than 90% of the words in a passage, then they are reading at a frustration level which causes a negative impact on their receptivity to intervention (Rasinski).

Effective Teachers of Reading

Teacher knowledge about the specific elements of fluency instruction is a significant predictor of students' growth in ORF (Lane et al., 2009). Lane et al. conducted a study of 117 teachers in grades kindergarten through third grade. Findings indicated that in the second grade, where the greatest amount of student growth in ORF can be expected (Hasbrouck & Tindal,

2006), teacher knowledge accounted for 86% of growth in reading fluency. When these results are applied to what is known about the developmental growth of students' reading skills, one can clearly see that teacher knowledge matters (Lane et al.).

The quality of the teacher is one of the most important determinants of student success (Berry, Hoke, & Hirsch, 2004; Blair et al., 2007). Students with learning disabilities rely on effective teaching practices implemented with fidelity in order to positively affect their learning outcomes (Darling-Hammond & Berry, 2006; Lose, 2008; McEneaney, Lose, & Schwartz, 2006). It is critical that teaching practices utilized during reading intervention sessions are not only research-based, but also model effective implementation of the desired skill (Denton et al., 2003), all the while addressing the individual learner characteristics. The choice of interventionist, therefore, is paramount to the success of intensive interventions when these sessions are a part of the identification process for special education services. If the interventionist employed during the stages of pre-referral actions is anyone less than a qualified, effective teacher of reading, then the accuracy of the identification process will be undermined (Kamil et al., 2008).

In 2005, the National Joint Committee on Learning Disabilities (NJCLD) published a report discussing the issues surrounding implementation of RTI as a means of identifying students with LD (NJCLD, 2005). The report presented many potential changes in professional roles and competencies that could arise as a result of RTI. One of the challenges regarding professional roles is the need to prepare general educators to administer frequent assessments and compile relevant data. Another challenge is defining what role support professionals, such as reading specialists, speech pathologists, etc., will have in the assessment and planning of

appropriate interventions (Vaughn & Roberts, 2007). Essentially all educators and support professionals will need to know how to deliver interventions with fidelity across a variety of participants in different settings (Deshler, 2005). Administrative roles will also expand to encompass planning for professional development and tracking competencies of those who deliver interventions (Hall, 2008). Lastly, the NJCLD report poses a series of critical questions about RTI, including questions about the qualifications of the interventionist (NJCLD, 2005). Among those questions is one that addresses the foundation of the current study: Does high-quality instruction require a qualified, effective teacher to deliver interventions? An assumption of the current study is an affirmative response to this question; therefore, researchers must investigate intervention methods that will allow effective teachers to maximize their limited instructional time in order to adequately meet the needs of all students who require remediation.

One-on-One Modeling

Modeling of ORF skills is an intervention technique whereby a student acquires the skill by observing one who is more proficient perform that skill (Bellini & Akullian, 2007; NICHHD, 2000). This one-on-one, maximum intensity instruction is provided by the general education teacher, the special education teacher, or a reading specialist. In some schools across the nation a paraprofessional, an instructional assistant, or perhaps even a trained volunteer is considered an acceptable alternative to a certified teacher of reading. For the purposes of this study, one-on-one interventions always referred to one qualified reading teacher modeling the desired skill while just one student observed and responded (Denton et al., 2003). Chard et al. (2002) found evidence to support the use of adult modeling of fluent reading. However, the authors discuss the

lack of practicality for effective, qualified teachers to implement one-on-one modeling, revealing the potential for models that make use of computer-assisted instruction as a substitute.

Modeling, along with explicit explanations and guided practice, is the heart of direct reading instruction (Rupley, Blair, & Nichols, 2009). Grounded in the theories of Vygotsky (1962), modeling provides a scaffold for learning between one who is proficient in a skill (e.g., the effective teacher) and one who is learning that skill (e.g., the student) (Blair, Rupley, & Nichols, 2007). As in any guided reading instruction, fluency interventions should focus on gradually transferring from the teacher to the student the responsibility for applying the knowledge learned through practice (Rupley et al., 2009).

Rasinski, Homan, & Biggs (2009) emphasize the need for teachers to model fluent reading during interventions for disfluent students. Coaching individual struggling students through the use of direct instruction and feedback is essential in order to address particular areas of concern. Setting aside time every day to model for students and monitor their progress through assisted reading practices is effective for demonstrating to students the important connection between good ORF and good reading comprehension (Rasinski et al., 2009).

Archer, Gleason, and Vachon (2003) promote the use of choral reading in which a teacher reads along with one student or a small group of students. Choral reading requires the teacher to use a slightly louder voice than the student in order to model and provide support for the positive aspects of fluent reading. This method has demonstrated effectiveness with readers who struggle with decoding skills (Archer et al., 2003). Archer et al. also discuss the benefits of using informational passages while practicing choral repeated readings, in order to build content knowledge.

Vaughn and Roberts (2007) encourage the use of repeated reading interventions, including the use of choral reading, modeled by a special education teacher, reading specialist, or other school personnel who is highly prepared in the procedures for ORF interventions. In addition to choral reading, they also recommend the use of paired reading, audiotapes, and computer reading. The authors found that students receiving tier two and tier three interventions generally make significant progress when provided 50 to 100 intervention sessions. After this amount of time, students who do not make significant progress may show gains but not enough to attain grade level performance expectations, and less than 10% will show little or no progress even though research-based practices have been utilized (Vaughn & Roberts).

Unfortunately, not all students do respond to best practices, even when they are administered intensively in a one-on-one situation (Dion et al., 2004). In 2000, Torgesen presented an overview of five studies in which research-based preventive reading interventions aimed at improving word reading skills were initiated by skilled educators. In all five studies, he found evidence of "treatment resisters," or students who did not progress, even after many hours of one-on-one tutoring (Torgesen). Similar findings were presented in a study by McMaster, et al. (2005), which examined the use of a dual-discrepancy approach for identifying students who are unresponsive to reading interventions. Despite the best efforts of those involved, and though it is at odds with expectations, at times even one-on-one instruction fails to produce desired results with students who struggle to learn to read.

Carbo (2007) recommends the use of powerful modeling methods during listening and repeated reading interventions in order to help struggling students overcome decoding difficulties and concentrate on the meaning of the passage. She suggests that students who are

already somewhat competent readers need models featuring low teacher involvement and high student independence (Carbo). The use of a prerecorded videotaped model, which students may interact with in a one-on-one setting, including self-recording of assessments by the students, would therefore seem appropriate for adolescent students with LD.

Videotaped Modeling

According to the Individuals with Disabilities Education Improvement Act (IDEA, 2004), the use of assistive technology must be considered for every student who receives special education services, including students with LD. Assistive technology (AT) is defined as the use of special devices, both mechanical and non-mechanical, to assist students in their learning, increase the accessibility of the classroom environment, allow students to compete and participate with non-disabled peers, and improve their quality of life through more independent living (Blackhurst, 2005). For students with LD who require reading fluency practice, examples of AT are voice-activated computer-based learning, a tape-assisted reading fluency lab, or pre-recorded video models viewed on personal computers. The setting for such AT could be the general education classroom, the resource room, and/or a separate technology lab location.

Technology has the potential for helping all students, including students with disabilities, learn new information and fully participate and enjoy the benefits of inclusion (Alper & Raharinirina, 2006). The elementary school student of today is quite comfortable with the use of a computer. The National Center for Education Statistics reported in 2003 that nearly 50% of the children in America under the age of 5 used a computer in their home, and by the age of 9, that statistic rose to 62.5% (U.S. Department of Commerce, 2004). In classrooms across America,

technology is playing a critical role in providing assistance to students with special needs by allowing these students to access the same curriculum as students without special needs (Hasselbring & Bausch, 2006; Rhodes & Milby, 2007). Technology as a tool for teachers also has unlimited potential for making their jobs easier and helping teachers create lessons that are motivational and learner-focused, all of which are goals of the interventions described in the present study.

Edyburn (2007) discusses the need for further research into using technology to enhance the reading performance of students with disabilities. He points out that the gap in reading achievement between students who are low achievers and what is expected of them may be due, in part, to continued use of outdated teaching practices. The fundamental question to be considered, according to Edyburn, is: At what point do we choose compensation through the use of technology rather than continued attempts at more traditional methods for remediation of reading skills for students who have struggled for years to achieve performance expectations?

Designing interventions for students with disabilities that harness the power of compensation through the use of technology is critical for meeting the unique needs of some students. The current study includes the use of a prerecorded, videotaped method of delivery. In a video model, the desired behavior or skill is demonstrated through a video representation of what that behavior or skill should look like (Bellini & Akullian, 2007). As discussed earlier, modeling provides a scaffold as learning is transferred from teacher to student (Vygotsky, 1962). Technology in the form of a prerecorded video model, can be a tool used to provide that scaffold (Hung & Nichani, 2002). The video model allows a learner to imitate and generalize the targeted skill (Hitchcock, Dowrick, & Prater, 2003; McCoy & Hermansen, 2007) through interactions

with a computer-based intervention. Video modeling has proven to be effective across a variety of populations for improving a wide range of skills and has shown success with generalization (Bellini & Akullian).

Summary

Intermediate elementary students with LD may read below grade level norms for ORF (Ferrara, 2005). Identifying and intervening on behalf of students with LD while they are still in elementary school is essential in order to avoid the negative impact the deficit can have on reading comprehension, particularly in the area of acquisition of science content knowledge (Carnine & Carnine, 2004; LaBerge & Samuels, 1974; O'Connor et al., 2001; Rasinski et al., 2006; Stanovich, 1980).

Inclusive practices in classrooms across our nation have led to expanded opportunities for multi-disciplinary collaboration amongst educators in order to best serve our increasingly diverse student population (Lamar-Dukes & Dukes, 2005; Raphael & Au, 2005; Vaughn & Roberts, 2007). The need for all students to receive quality instruction from effective teachers has become more evident with each passing year (Berry et al., 2004; Blair et al., 2007; Darling-Hammond & Berry, 2006; Lose, 2008; McEneaney et al., 2006). Efforts are currently underway to dispense with outdated teaching practices and employ the use of technology when appropriate in order to compensate for individual differences in how students learn (Edyburn, 2007).

Fluent reading is the result of a complex interaction of all the sub-skills of reading (Perfetti, 1985; Wolf & Katzir-Cohen, 2001). Good readers successfully manage the cognitive demands placed upon them when faced with unfamiliar text, resulting in oral reading that sounds

fluid, accurate, expressive, and effortless (Samuels, 2006). To be more specific, Hudson, Pullen, Lane, and Torgesen (2009) developed a conceptual model for examining ORF in which the sub-skills of orthographic knowledge, sight word vocabulary, decoding fluency, and multiple cue efficiency are shown to interact with the meaning-related elements of comprehension, vocabulary, metacognition, and background knowledge. The researchers maintained that in order to help students develop into fluent readers, teachers must recognize that comprehensive instruction and well-planned, intensive practice will need to occur in all the aforementioned areas (Hudson et al., 2009).

CHAPTER 3
RESEARCH DESIGN AND METHODOLOGY

Introduction

The purpose of this study was to determine the impact of including repeated reading interventions within a problem-solving framework of services for individual intermediate students with learning disabilities (LD). Specifically, this study investigated whether a videotaped delivery method of a repeated reading intervention improved ORF at the same rate as a one-on-one delivery method for four fifth-grade students with LD. Using an ABCBC alternating-phases design, the study began with a short baseline, Phase A, followed by two treatment phases. Phase B utilized one-on-one repeated reading interventions delivered by an experienced, effective teacher of reading. Phase C utilized a pre-recorded videotaped version of the same teacher following the same procedures. Both quantitative and qualitative data were analyzed to determine the preferred learning method for each participant.

The significance of this study was to contribute to the body of empirical research on best practices for intervening on behalf of individual intermediate students with LD who read below grade level norms for ORF. Results of this study may provide busy teachers with a practical, time-saving procedure for positively impacting academic outcomes for their students who struggle to read.

This chapter begins by reviewing the research questions to be addressed by the study, followed by a discussion of the research design. A full description of the participants, setting, and instrumentation is presented, along with procedures for collecting and analyzing data across

both phases. Issues of reliability and validity are discussed, and the chapter closes with a brief summary.

Research Questions

The study was designed to address the following research questions:

1. When individual fifth-grade students with learning disabilities receive repeated oral reading interventions, to what degree, if any, does the number of words read correctly per minute increase?
2. Does a one-on-one delivery method or a videotaped delivery method lead to more rapid increases in oral reading fluency measurements for individual fifth-grade students with learning disabilities?
    a. To what degree, if any, does the number of words read correctly per minute increase for the participants while using each approach?
    b. To what degree, if any, does the number of words read incorrectly decrease while using each approach?
3. Which approach, one-on-one or videotaped, do the participants prefer?

Evidence-Based Practice in Special Education

The field of special education has for many years struggled with how to best define what constitutes evidence-based practices (Slavin, 2008). In a field where the subjects possess a complex array of characteristics, it is apparent that no one methodology can be established as meeting the needs of answering the numerous types of questions which arise (Odom et al., 2005). In 2003, the Council for Exceptional Children's Division for Research created a task force

charged with: (a) studying the usefulness of different types of educational research methodologies and (b) proposing quality indicators for each (Odom et al.). Single-subject research was identified as one of the useful methodologies for conducting special education research, and a set of quality indicators were proposed that might be used to identify a single-subject study as evidence based (Horner et al., 2005).

The quality indicators described by Horner et al. (2005) were grouped according to the following critical features: participant and setting description, dependent variable, independent variable, baseline, experimental control/internal validity, external validity, and social validity. A rubric for the use of evaluating single-subject studies conducted on repeated reading interventions for students with LD was created based on the quality indicators (Chard et al., 2009) and used to guide the implementation of this study. This chapter carefully considers each of the critical features.

Research Design

The study addressed the research questions by using a single-subject alternating-phases design. The two dependent variables were the reading rate and reading accuracy curriculum-based measurements (CBMs) taken during every intervention session when each participant read aloud the unfamiliar grade level passage #2. The reading rate measurement was the number of words read correctly in one minute (WCPM) when reading aloud a passage that was at grade level readability (fifth-grade) for the participants. A word was counted as read correctly if it was pronounced correctly as used within the context of the sentence, and any self-corrections made within three seconds were considered to be correct. The reading accuracy measurement was the

number of words read incorrectly, or errors per minute (EPM), on the same passage. Errors included any word mispronounced within the context of the sentence, word omissions, words read out of order, and word substitutions. All of the CBMs were audio-recorded and checked for reliability in scoring by a trained independent observer at least 33% of the time.

The independent variables were the videotaped versions of the intervention and the one-on-one versions of the intervention, both of which featured the same interventionist following the same research-based procedures for improving ORF.

Fidelity of Implementation

In single-subject research, fidelity of implementing the independent variables must be established (Horner et al., 2005). In this study, fidelity was established by having the same interventionist in all phases following a scripted procedure for the intervention across phases. Additionally, an independent trained observer conducted fidelity checks on at least 33% of the sessions. During these fidelity checks, the observer watched carefully for adherence to the prescribed steps in the procedures, completing separate checklists for each participant as well as the interventionist. A fidelity rating of at least 95% was the desired goal of this study (Kazdin, 1982).

Research Timeline

Institutional Review Board (IRB) permission to conduct the study was requested in January 2009, and permission was granted on February 12 of that same year (IRB #SBE-09-06037, Appendix A). School district permission was also requested and granted at the same time (Appendix B). Once IRB and district approval was obtained, parental consent (Appendix C) and

student assent (Appendix D) letters were signed. Prior to asking for these signed letters, the researcher conducted a 30-minute group session with all four participants in which she described the study and answered any questions they might have. Once signed parental consent letters were obtained, the researcher met again with each participant privately in order to answer additional questions and secure signatures for student assent. Documents were stored in a locked cabinet for the duration of the study and will be destroyed within five years after completion of the study.

Preceding the start of interventions three CBMs of ORF were taken, which were matched to predetermined selection criteria for participation in the study. The purpose of the baseline data was to verify a condition of disfluency in each participant. These measurements are referred to as Phase A.

Next, a brief training period took place during which participants were taught the procedures for the interventions. The training took two half-hour sessions, scheduled at the same time as the future intervention sessions would be held. Training procedures included introducing participants to the notebooks that would contain their study paperwork, practicing repeated reading using both one-on-one and videotaped methods, and practice with the self-recording process on the computer.

The interventions began on February 26, 2009, with ORF interventions delivered by the interventionist through one-on-one instruction. Interventions took place on Mondays, Tuesdays, Thursdays, and Fridays between 9:25 am and 10:00 am. In the beginning of March, it was necessary to work around the schedule for administration of Florida's statewide standardized assessments, but any slight changes in the schedule for interventions were duly noted. This initial Phase B continued until nine data points were collected using curriculum-based probes. An a

priori decision was made to collect nine data points in each phase in an attempt to control for threats to the internal validity of the study. Nine probes provide adequate practice in repeated reading while minimizing boredom and the impact of maturation or testing effects.

With no delay between phases, Phase C continued the same intervention procedures used in Phase B, with the only difference being the method of delivery. During Phase C, the intervention was delivered through a video recording of the same interventionist modeling the same procedures as those used during Phase B. The intervention itself was carefully scripted to ensure fidelity of treatment across phases, and the independent observer continued her observations of one-third of the sessions. Phase C also concluded after nine data points were collected. The end of Phase C coincided with a school-wide spring break, which lasted one week, after which the participants promptly returned to a second Phase B, receiving interventions once again through one-on-one instruction. The study proceeded in this manner following an ABCBC alternating-phases design and eventually concluded after the second Phase C. At the conclusion of the second Phase C, all four participants were interviewed by the independent observer utilizing a structured interview format. A copy of the participant interview script is included in Appendix P.

Participants

Based on the following selection criteria, four participants for this single-subject study were purposively selected:

1. The participant must be a fifth-grade student.

2. The participant must be previously identified as reading learning disabled via the IQ-achievement discrepancy model.

3. Lexile reading ability measure must be below the proficiency range for fifth grade (779).

4. Oral reading fluency rate must be below the Fall 50th percentile for fifth-grade (less than 110 WCPM), according to Hasbrouck & Tindal (2006) established norms.

All four students selected as participants received inclusive special education services from the same special education teacher for their daily reading instruction, and all used the same district-approved Harcourt Science curriculum in their inclusive science classrooms. The use of pre-established selection criteria reduced the chance of selection bias and permitted a choice of participants who would minimize internal threats to the validity of the study.

For the purposes of this study, the participants' reading ability was established as below grade level through the administration of the computer-based Scholastic Reading Inventory (SRI) assessment, which yields a Lexile measure of reading ability. All four participants scored below the fifth grade proficiency range of 779 - 1039. This criterion was necessary in order to ensure that passages utilized for easier level practice during the interventions were appropriate for all four participants.

When all participants were administered the same one-minute Harcourt ORF assessment by their general education classroom teacher, utilizing unfamiliar fifth-grade level text, all four participants were reading at a rate lower than 110 WCPM. Two additional baseline ORF assessments were administered to each participant by the researcher to ensure that a valid,

reliable assumption of disfluency was attained. These three measurements became the baseline phase A of the study. Data for Phase A are shown in Table 1.

Characteristics of each participant are detailed in the paragraphs to follow and are summarized in Table 1 All data were accurate as of the conclusion of baseline Phase A.

Table 1
Participant Characteristics

Student	Sex	Age	Low SES	Race Ethnicity	2008 FCAT Level/DSS	Lexile	Phase A WCPM		
Student 1	M	10	No	White	3/323	679	105	108	99
Student 2	M	11	Yes	Hispanic	1/272	565	92	101	101
Student 3	M	11	Yes	Hispanic	2/277	755	84	74	59
Student 4	F	11	Yes	Black	1/273	761	87	74	88

Student 1

Student 1 was a 10-year-old fifth-grade boy who is White, speaks English at home, and did not qualify for free and/or reduced price lunch. He has never been retained and was diagnosed with a specific learning disability in the area of reading, and attention deficit/hyperactivity disorder (ADHD) for which he takes medication upon arrival at school each day. According to his Individual Education Program (IEP), he receives special education services through support facilitation and direct instruction and is entitled to flexible scheduling, setting, and presentation accommodations when taking standardized tests. Within his general education classroom, he receives preferential seating, extra time with his general education teacher, accommodated spelling lists, and a typed list of the weekly schedule in advance. Student 1 has a twin brother, who is not diagnosed with a learning disability. Besides his brother, he lives with his mother and one other older brother, and he has attended this school since it opened in 2004.

Student 1 self-reported at the beginning of fifth-grade that he likes math and science, but he did not like to read.

Student 1 scored a level 3 out of 5 on the 2008 Reading FCAT and a level 3 out of 5 on the 2007 Reading FCAT. His developmental scale score in reading fell by 3 points, from 326 to 323, between these two administrations.

His Lexile reading measure from the September 2008 administration was 679, within the "Below Basic" fifth-grade range of 605 - 778. One year prior, his Lexile measure was 562, indicating he made a 17% gain in reading ability in the last year.

Student 1 has a history of poor ORF. His initial fluency assessment at the beginning of third grade (dated August 7, 2006) was 52 WCPM, placing him below the 50th percentile for his grade (Hasbrouck & Tindal, 2006). His fluency assessment at the beginning of fifth-grade (dated September 2008) was 105 WCPM, which still placed him below the 50th percentile for his grade (Hasbrouck & Tindal, 2006).

Student 2

Student 2 was an 11-year-old fifth-grade boy who is Hispanic, speaks Spanish at home, and qualified for reduced price lunch. He had received support from the school English Speakers of Other Languages (ESOL) resource teacher since 2002, and the 2008-2009 school year was his first year without that support. He was retained this year, making this his second year of fifth grade. Student 2 was diagnosed with specific learning disabilities in mathematics, reading, and language arts. According to his IEP, he receives special education services through support facilitation and is entitled to flexible scheduling, setting, responding, and presentation

accommodations when taking standardized tests. Within his general education classroom, he receives increased instructional time, variation in instructional methods, including computer-based practice opportunities, repetition of information, and tasks broken down into workable and obtainable steps. Student 2 lives with his mother, father, and two sisters, one of whom is an infant. He self-reported at the beginning of the current school year that he did not enjoy reading and did not know if he is a good reader or not.

Student 2 scored a level 1 out of 5 on the 2008 Reading FCAT, the third year in a row that he scored at this lowest possible level. His developmental scale score in reading went from 222 in 2007, to 272 in 2008. Over that same period, his Mathematics FCAT scores actually decreased from 272 to 179.

His Lexile reading measure from the September 2008 administration was 565, within the "High Risk" fifth-grade range of 0 - 604. One year prior, his Lexile measure was 494, indicating a 13% gain in reading ability in the last year.

Student 2 has a history of poor ORF. His initial fluency assessment at the beginning of third grade (dated August, 2005) was 67 WCPM, placing him below the 50th percentile for his grade (Hasbrouck & Tindal, 2006). His fluency assessment at the beginning of September 2008 (his second year of fifth grade) was 92 WCPM, which still placed him below the 50th percentile for his grade (Hasbrouck & Tindal, 2006).

Student 3

Student 3 was an 11-year-old fifth-grade boy who is Hispanic, speaks English at home, and qualified for reduced price lunch. He was retained in first grade, and this year he was

assigned to fifth grade, meaning that he was promoted without attaining mastery of all essential skills. He was diagnosed with specific learning disabilities in reading, language arts, and mathematics and has ADHD but takes no medication. According to his IEP, he receives special education services through direct instruction for reading and mathematics and support facilitation for language arts. Student 3 is entitled to flexible scheduling, setting, responding, and presentation accommodations when taking standardized tests. Within his general education classroom he is given boundaries to aid in completion of tasks, encouraged in the use of a planner, and participates in a token economy behavioral system. Accommodations include repetition of information, tasks broken down into workable and obtainable steps, and resource room setting for tests and quizzes, including verbal response when writing is not the goal of assessment. Student 3 lives with his mother, father, and two sisters. He self-reported at the beginning of the current school year that he did not like to read and did not think he is a good reader.

Student 3 scored a level 2 on the 2008 Reading FCAT, but no previous FCAT scores are available for comparison since he moved to Florida during the 2007-2008 school year. His reading developmental scale score on the 2008 FCAT was 277.

His Lexile reading measure from the September 2008 administration was 755, within the "Below Basic" fifth-grade range of 605 - 778. In April of 2008, his Lexile measure was 714, indicating a 5% gain in reading ability over the six-month period.

A fluency assessment administered to Student 3 at the beginning of fifth grade (dated September 2008) was 84 WCPM, which placed him below the 50th percentile for his grade (Hasbrouck & Tindal, 2006).

Student 4

Student 4 is an 11-year-old fifth-grade girl who is black, speaks English at home, and qualifies for reduced price lunch. She has never been retained and was diagnosed with specific learning disabilities in reading, language arts, and mathematics. According to her IEP, she receives special education services through support facilitation and is entitled to flexible scheduling, setting, and presentation accommodations when taking standardized tests. Within her general education classroom, she has items read to her when reading is not the objective for assessment, and testing may occur in a resource room setting with the accommodation of additional time. Student 4 lives with her mother, father, three brothers, and one sister and self-reported at the beginning of fifth grade that she likes to read and thinks of herself as a good reader.

Student 4 scored a level 1 out of 5 on the 2008 Reading FCAT and a level 3 out of 5 on the 2007 Reading FCAT. Her developmental scale score decreased by 14 points, from 299 to 273, between these two administrations.

Her Lexile reading measure from the September 2008 administration was 761, within the "Below Basic" fifth-grade range of 605 - 778. One year previous, her Lexile measure was 519, indicating a 32% gain in reading ability in the last year.

Student 4 has a history of poor ORF. Her initial fluency assessment at the beginning of third grade (dated August 2006) was 62 WCPM, placing her below the 50th percentile for her grade (Hasbrouck & Tindal, 2006). Her fluency assessment at the beginning of fifth grade (dated September 2008) was 87 WCPM, which still placed her below the 50th percentile for her grade (Hasbrouck & Tindal, 2006).

Interventionist

The interventionist throughout the study was the fifth-grade reading specialist at the school where the study took place, as well as the researcher in this study. She was well-known by the participants, having served as their teacher during previous sessions aimed at remediating reading skills other than ORF, such as word identification and vocabulary. These previous sessions were held for 30 minutes each day, three or four days per week, as a part of the school-wide problem-solving program. The interventionist was not the teacher of record for the participants, and she never had the responsibility for assigning grades or consulting with other teachers about assigning grades. However, she did work closely as a team with the general and special education teachers to help struggling students learn skills and strategies that would facilitate successful academic and social outcomes in general education classrooms.

The interventionist was an experienced teacher who was dual-certified in both elementary education (grades 1-6) and exceptional education (grades K-12) in the state of Florida. She earned a Master's degree in elementary education, and at the time of the study was a doctoral candidate for a Ph.D. in education, exceptional education track. The interventionist had 16 years of teaching experience in grades pre-kindergarten through fifth, including eight years conducting action research at two different elementary schools specifically in the area of ORF. Fluency Labs, which have been established under her direction at two local elementary schools and replicated at a third elementary school, have benefited hundreds of third, fourth, and fifth grade students over the past eight years. Her immersion in the latest research-based practices has enabled her to modify and adapt these labs to benefit students who experience difficulties in learning to read.

In addition to her work with Fluency Labs, the interventionist served as the graduate Student Director at a university reading clinic for urban middle school students with LD. In this capacity she modeled for undergraduate pre-service teachers best practices for assessing and promoting literacy development in struggling readers. The clinic focus was on promoting fluency in science content-area reading through the development of vocabulary, as well as direct instruction in utilizing comprehension strategies with nonfiction text. The interventionist provided the research base for strategies implemented with clients.

Settings

School Setting

The setting for this study was a large Florida suburban elementary school where 26% of the students received free and/or reduced lunch. At the time of the study, the school was in the fifth year of operation with a total enrollment at just over 880 students, of which 159 were in the fifth grade. Racial demographics for the school were as follows: 66% White, 14% Hispanic, 9% Black, 4% Asian, and 7% Multiracial, for a total minority rate of 34%. All classes were taught by teachers certified by the state of Florida Department of Education, and 39.6% of the total 55 teachers held Master's degrees. The fifth-grade team consisted of seven general education classrooms with 23 or fewer students in each and one specific learning disabilities teacher who also provided services to two other grade levels. Additional assistance to this teaching team was provided by one reading specialist and four non-degreed instructional assistants, all of whom also provided assistance to five other grade levels.

In the previous school year, all 146 fifth-grade students were tested using the 2008 Florida Comprehensive Assessment Test (FCAT), and 78% demonstrated proficiency in reading by scoring a level three or above. This rate of proficiency represented an increasing trend for the school since 73% of fifth graders were proficient in reading in 2007, and only 70% were proficient in 2006.

In 2008, 60% of the fifth-grade students with LD and 58% of the fourth-grade students with LD (matched to the current fifth-grade group) were not proficient in reading. At the time of the study, there were 15 students identified as LD and receiving inclusive special education services in the fifth grade, representing about 9% of the total fifth grade population.

This school was rated an "A" school by the Florida Department of Education during the 2007-2008 school year. The school made adequate yearly progress (AYP) in reading but did not make AYP in mathematics and writing due to limited progress within the subgroups of students with disabilities and economically disadvantaged students.

Intervention Setting

All interventions took place within a resource room setting during the same morning session held Monday, Tuesday, Thursday, and/or Friday, three or four days per week. The time period of 9:25 until 10:00 had been set aside for intensive interventions for any struggling fifth-grade students who may or may not already be identified as LD. As a part of the school-wide problem-solving framework for reading interventions, the four participants were assigned to the reading specialist because they exhibited similar deficits in reading skills. Other fifth-grade students who also struggled with reading skills were assigned to other teachers at that same time.

At no time were there any students present in this particular resource room other than the four participants. Adults in the room included the interventionist and the independent observer; present on at least 33% of the occasions. At all times, even during one-on-one intervention sessions, the interventionist was positioned in the room so that she could easily view the activities of all four participants.

The resource room utilized for the study was a portable classroom, which in every way resembled a typical fifth-grade classroom. Furniture included 22 student desks, one teacher desk, one large kidney-shaped table, two filing cabinets, two storage cabinets, three desktop computers, one laptop computer, bookcases, and a large whiteboard. Windows on two opposing walls permitted a well-lit, pleasant atmosphere. There was also a bathroom with a sink as well as a classroom sink and water fountain. Materials utilized by the study participants were stored in the same place throughout the study.

The context for each intervention session was the same. The fifth-grade team of teachers, including the reading specialist, had previously made the decision to use science curriculum in all intervention groups to facilitate practice of reading skills with nonfiction text. Therefore, the interventionist arranged a series of science learning centers for the four participants to rotate through over the course of a week, ensuring that all four students participated in all centers at least once each week. When all students had participated in all centers, then new centers were introduced. This pattern of instruction was established during baseline phase A so that by the time the interventions began, participants were already accustomed to the level of independent practice required in the resource room.

When it was time for the study interventions to begin, daily participation in the ORF intervention was simply added to the rotation of learning center activities. Utilizing this context for intervention allowed the interventionist to focus on one student at a time during the ORF intervention. Learning centers other than the ORF intervention included a science key word vocabulary worksheet, a hands-on science activity that involved reading, following directions, and providing written response, and computer-based activities. All computer-based activities accompanied the science unit, accessed by signing on to the Harcourt Publisher's website on two of the resource room computers which were not being used for study procedures. The learning center activities were carefully designed to complement the content of passages utilized in the intervention, practicing utilization of key word vocabulary and comprehension of science content, not ORF. Participants tracked their own progress through the learning centers with a personal packet of materials, including a checklist of learning center activities.

Participants were scheduled to arrive at the resource room at 9:25 am. In order to accommodate all four participants in a limited time, the interventionist began with the participant who arrived first. By the time the first participant was ready to record his or her readings, the other participants had all arrived, and the interventionist randomly called on another student to begin the intervention. This random assignment of actual intervention time was necessitated by the tight time schedule, coupled with the tendency of classroom teachers to occasionally delay releasing a student to the resource room in a timely fashion. As soon as a participant completed the ORF intervention, he/she returned to the learning center in which he/she had been previously engaged.

Instrumentation

Instruments utilized for data collection consisted of two reading passages per session, including scoring reports for each passage, Fluency Progress graphs, participant Daily Reports, interventionist Daily Logs, and procedural checklists for both the participants and the interventionist. Additionally, scripts were created for the intervention procedures, student directions, and a structured participant interview. A detailed description of each of the instruments is included below, and samples of each can be found in the Appendix.

Passages

Harcourt Publishers was the mandated science curriculum to be used at all elementary schools in the district where the study took place. Passages utilized throughout the study came from the Harcourt Science fifth-grade on-grade level and below-grade level readers, provided as supplemental materials. Easier level passage #1 (see Appendix E), the repeated reading practice passage, was measured as having a readability score between grade level 3.5 and 4.8. Grade level passage #2 (see Appendix F), the passage on which growth in grade level ORF was tracked, was measured at a readability level between 5.1 and 5.9. The two passages used for each intervention contained some overlap of key vocabulary.

Passages were measured for readability using the Flesch-Kincaid grade level scale, available as a tool in Microsoft Word documents. The procedure for measurement of readability was as follows: The researcher typed each passage found in the Harcourt supplemental reader separately into a Word document. Text was then highlighted and measured with the Flesch-Kincaid index for readability. If the indicated reading level was either above or below the desired

range, the researcher manipulated the text vocabulary and/or sentence structure until the desired readability was attained. Key vocabulary words, however, were maintained across passages.

The passages chosen from the science curriculum were unfamiliar to the participants in order to control for practice effect. This step minimizes the threat to internal validity of measurement and is well-documented in ORF research (Nelson et al., 2004; Rasinski, 2003; Samuels, 1979, 2006). In this study, the general education teachers and the special education teacher who worked with the participants for the majority of the school day did not use the supplemental texts from which passages were taken, thus controlling for practice effect.

Each passage utilized in the study was between 150 – 200 words in length and was typed separately onto a hard copy for use by the participants. Passage length within this range ensured that participants would have enough text to read in one minute but not so many words that the amount of practice would take too long and become frustrating. Each participant was given identical copies of the same passages, always typed using Times New Roman font, size 14 point, and always limited to one piece of paper. A single 8-point line of text at the bottom of each page indicated the source of the passage, including page numbers, title of supplemental text, readability measurement, and total word count. Samples of both passage #1 and passage #2 are included as Appendix E and F, respectively.

Scoring reports for each passage were created for use by the interventionist and the independent observer. The scoring report contained the same text as the two types of passages, with the addition of word count guides and a section at the bottom of the page to use for recording scores. Each scoring report was also limited to one typed page, accomplished by

reducing the font size to 12 point. Samples of both easier level passage #1 and grade level passage #2 scoring reports are included as Appendix G and H, respectively.

Electronic copies of all passages were stored on a USB flash drive in folders labeled with the session number. Individual documents were titled as to whether they were easier level passage #1, grade level passage #2, scoring report #1, or scoring report #2 for the corresponding session. Prior to each session, four hard copies were printed of each of the two passages as well as each of the two scoring reports. When sessions were to be checked for reliability by the independent observer, an additional four copies of each scoring report were made for her use. At the conclusion of each scoring session, all copies of completed scoring reports were stored according to the student number in a locked filing cabinet. The student hard copies of each passage were stored in files labeled by session number to be used again in future studies with different participants.

Fluency Progress Graph

The Fluency Progress graph was an essential tool for providing feedback to participants on their progress throughout the study (see Appendix I). This line graph was created for each participant depicting a visual representation of their CBMs of ORF (one of the dependent variables) for each grade level passage #2. In addition to a line demonstrating the WCPM measures, there was a line showing the participant's goal for improvement. The goal for each session was calculated by determining the average of the four preceding measurements of WCPM and increasing that average by ten percent. Graphs were created by linking to a Microsoft Excel spreadsheet containing all quantitative data collected in the study. Electronic

copies of Fluency Progress graphs and spreadsheets were stored on a password-encrypted USB jump drive, in a folder labeled with the coded student number. A sample Fluency Progress graph, as it appeared to the participant, is included in Appendix I.

Daily Report

The Daily Report (see Appendix J) was a short questionnaire filled out by the participant each day, indicating how the participant felt about the session that day. The participant completed this report at the end of each session after all other intervention activities were complete. Questions addressed topics, such as how they were feeling and whether or not they had any difficulties. Space was provided in case they had any questions. These data were collected for the purpose of contributing to the discussion on the social validity of the study. A sample Daily Report is included in Appendix J.

In order to maintain confidentiality, participants' names were indicated on the Daily Report in their notebook and the entire notebook was returned to the interventionist at the conclusion of each session. Immediately after the participants left the room, the interventionist removed the Daily Report from the notebook and used scissors to cut off the name portion. She then recorded the student's code number (known only to the interventionist) in the upper right-hand corner of the form. Completed Daily Reports were stored in a locked filing cabinet.

Daily Log

The Daily Log (see Appendix K) was completed during each session. This form provided space for the interventionist to make note of any anecdotal observations she had about the participants that day. In order to ensure confidentiality, all observations were made using only

coded student numbers, never indicating participant names, and completed Daily Logs were stored in a locked filing cabinet. These data were collected for the purpose of contributing to the discussion on the social validity of the study. A sample Daily Log is included in Appendix K.

Procedural Checklists

Throughout the study, during both the one-on-one phases and the videotaped phases, an independent observer periodically completed a procedural checklist to assess whether or not the participants (see Appendix L) and the interventionist (see Appendix M) were correctly following all procedures as outlined in the study. The purpose of the checklists was to ensure fidelity of implementation and inform the researcher of any flaws in the students' procedural performance, which must be immediately corrected. In order to maintain confidentiality and not reveal student code numbers, the procedural checklists were filled out with the participant's name on top, coded in the upper right-hand corner by the interventionist at the conclusion of the session, and the name portion was cut off with scissors. The checklists were stored in a locked filing cabinet.

Four different procedural checklists were utilized: Participant and interventionist checklists for the one-on-one sessions and participant and interventionist checklists for the videotaped sessions. Samples of each are included as Appendix L and M.

Scripts

A key element of ensuring fidelity of implementation across the two separate phases was the creation of scripted intervention procedures. By following a script, the interventionist provided the same level of support in both the one-on-one and the videotaped phases. The script for intervention procedures is included as Appendix N.

In this study, the procedures at times required participants to perform independent activities. Written student directions were included in student notebooks to provide support in case students forgot verbal directions. The Student Direction sheet remained the same across phases. A copy of the Student Directions is included as Appendix O.

Participant interviews conducted at the conclusion of the study were also scripted in order to guide the independent observer in asking the same questions of all four participants. A copy of the structured Participant Interview is included as Appendix P.

Participant Notebooks

Throughout the study, each participant had his or her own notebook containing the previously described instruments. All four notebooks were black three-ring binders labeled with the name of the participant on the front. When not in use during a session, the notebooks were stored in the researcher's locked classroom in a locked filing cabinet. Upon opening their notebook each day, the first thing the participant would see was his/her Fluency Progress graph, which had been updated prior to each session to include data from the previous session. Next would be a copy of easier level passage #1 (always limited to one piece of paper), followed by grade level passage #2, (also just one piece of paper), a blank Daily Report, and a copy of the Student Directions. The first four items were removed after each session was complete. Materials for the next day's session would be put in the notebooks each day just prior to the start of the session. The Student Directions were kept in a plastic sleeve at the back of the notebook and remained in that same place for the duration of the study.

In order to ensure confidentiality of participants, the Student Notebooks were labeled by the participants' first names only, never indicating the coded student number. When the Fluency Reports and Daily Reports were removed from the notebooks at the conclusion of each session, names were cut off each form and they were labeled with the student number prior to storing the hard copies in a locked filing cabinet, separate from the notebooks. This procedure helped ensure that both the participants and the independent observer remained unaware of assigned coded student numbers.

Data Collection Procedures

Permission was granted to collect data on the participants' socio-economic status, age, race, gender, and complete academic history as well as current and future academic levels of achievement. The Individual Educational Program (IEP) document, which provides a complete description of personal special education goals and objectives, was examined as well as any cumulative records. These sources permit the researcher to describe in detail each participant's personal characteristics, which are referred to in the discussion section when describing how they responded to the intervention.

In accordance with the Family Educational Rights and Privacy Act (FERPA), steps were taken to ensure confidentiality of participants by protecting data. Each participant was assigned a coded number 1 through 4, and the list of codes and names were kept in a locked cabinet in a university office, accessible only to the researcher and her faculty supervisor. Participants were not aware of their own assigned number or that of their classmates. All data, including audio recordings, were labeled by code for storage purposes rather than name, and audio tape

recordings were destroyed at the conclusion of the study. All electronic data were stored on password-encrypted jump drives and stored in two separate locked cabinets in the researcher's locked classroom--one for the audio recordings and another for all other study documents. A summary of the measures taken to ensure protection of pupil rights for confidentiality of participants and their parents is presented in Table 2.

Baseline Procedures

A criterion for selection in the study was a condition of disfluency. This condition was verified through the collection of three different ORF measurements using fifth-grade level passages, taken on three different occasions. On all three measurements, the participants scored below the 50th percentile for fifth grade (less than 110 WCPM) according to Hasbrouck & Tindal (2006) established norms.

These WCPM measures established a baseline, or phase A, of the study. Throughout the baseline phase, no ORF interventions were provided by either the interventionist or the general or special education teachers assigned to the participants. Data for Phase A were shown in Table 1.

Table 2
Confidentiality Safeguards

Item	Contents	Who May Access	Where Stored	When Destroyed
Hard Copy List	Names of participants and corresponding code numbers	Researcher only	Locked cabinet #1 in University office--will remain separate from all other documents until destroyed	Within five years of completion of study
Password-Encrypted USB Jump Drive #1	Audio recordings of participants reading passages aloud	Researcher only; coded copy to be periodically shared once with each participant (during final interview)	Locked cabinet in researcher's office	At the conclusion of study; transcribed and coded copies will be kept for five years
Password-Encrypted USB Jump Drive # 2	Èlectronic forms such as Fluency Progress graphs, other study information, and final interview audio recording	Researcher only	Locked in cabinet #3 in researcher's office	Interview audio recording destroyed after transcription and coding; all other forms within five years after completion of study
Hard Copies of Completed Instruments	Fluency Progress graphs, Daily Reports, Daily Logs, Procedural Checklists, Scoring Reports, etc.	Researcher Only	Locked in cabinet #3 in researcher's office	Within five years of completion of study

Participant Procedures During One-on-One Interventions

At least three times a week during each one-on-one intervention phase, otherwise known as Phase B, the participant sat at a table across from the interventionist in the resource room and opened his or her notebook. The session began with the interventionist prompting the participant

to look at the Fluency Progress graph in their notebook and observe the results of the last session. After making note of the goal for improvement, the participant then turned to the copy of easier level passage #1.

Following the direction of the interventionist, the participant progressed through the steps of listening (once) and repeated readings (twice) of easier level passage #1. Prior to beginning the listening stage, the interventionist prompted the participant to listen carefully to how each word was pronounced. During the listening stage, the participant kept his or her eyes on the words while listening to the interventionist read the passage aloud with exemplary fluency. At the conclusion of the listening stage, the interventionist prompted the participant to begin reading aloud with her, matching her pace and making the passage "sound just like I make it sound." When the passage was read one time completely through, the interventionist quickly prompted the participant to read the same passage along with her again in its entirety. No explicit immediate error correction was provided because immediate feedback would undermine the fidelity of implementation of the independent variable.

After the second oral reading, the participant was directed to pick up the notebook and move to a nearby computer. Once there, the participant put on headphones with an attached microphone, clicked on the voice recorder, and recorded one final reading of easier level passage #1, and saved the recording under their own name as follows; "First name1," for example, "Mary1." When that was complete, the participant turned in the notebook to the copy of unfamiliar grade level passage #2 and recorded that on the computer as well, except this time the recording was saved as "First name2," for example, "Mary2." At no time were participants permitted to pre-read grade level passage #2.

After recording and saving grade level passage #2, participants turned to the Daily Report. Their final responsibility of the session was to fill out this short questionnaire, indicating how they felt about the session that day. When the Daily Report was completed, the entire notebook containing all hard copies was returned to the interventionist.

Interventionist Procedures During One-on-One Interventions

At least three times a week during each one-on-one intervention phase, otherwise known as Phase B, the interventionist prepared the materials in the resource room for the upcoming session. She ensured that the student notebooks contained the necessary hard copies of instruments and placed them on the same table each time. The interventionist placed the script for procedures and proper scoring reports in her own notebook to use as instruments for reading the passage during that session. She turned on the computer and plugged in the headphones with microphone attached. When the first participant entered the room, the participant sat across the table from the interventionist. The session began with the interventionist directing the participant to turn to their personal Fluency Progress graph (see Appendix I) and view the results of the last session as well as their goal for improvement during the upcoming session. Then, the interventionist continued to follow the script, directing the participant to turn to his or her hard copy of easier level passage #1.

Following the script, the interventionist progressed through the steps of three repeated readings of easier level passage #1, reminding the participant to just listen the first time and then read aloud with the interventionist the second and third time. After the third reading, the interventionist prompted the participant to move to a nearby computer, click on the voice

recorder, and commence with recording easier level passage #1 and unfamiliar grade level passage #2 on their own. At this point, the interventionist left the first participant to work independently and returned to the table to prepare materials for the next participant. The interventionist immediately took a few moments to fill out the Daily Log (see Appendix K), writing down behaviors and/or anecdotal notes about the interaction with the participant. The subsequent interventions proceeded in the same manner as before, with the interventionist following the aforementioned steps with each new participant.

When all participants completed the intervention and returned to their classrooms, the interventionist listened to the recorded passages, scoring each recording for both rate and accuracy. The interventionist then recorded the data on a hard copy scoring report, which was then transferred to a Microsoft Office Excel spreadsheet. The hard copies of scoring reports were coded for identification and stored in a locked filing cabinet along with the hard copies of the Fluency Progress graphs (see Appendix I) and Daily Reports (see Appendix J) collected from each participant that day. The interventionist transferred the audio recordings to a password-encrypted USB jump drive designated solely for this purpose and then deleted the recordings from the computer desktop used by the participants. Prior to copying each recording, she renamed each file as Student 1, 2, 3, or 4 in order to protect the confidentiality of the participants. Finally, the interventionist assembled hard copy materials for each notebook for the next day.

Procedures for Creation of Videotaped Interventions

Recording of videotaped interventions took place on a laptop computer using a factory-installed Dell Integrated Webcam and Intel® High Definition Audio HDMI Sound Device. Recordings were made in the school recording studio with a green (non-distracting) wall in the background, as shown in the screen shot below.

During the recording session, the interventionist began by looking straight into the camera, appearing as if she is speaking directly to the participant while following the script and reviewing the Fluency Progress graph. She then progressed through the steps of three repeated readings of easier level passage #1, reminding the participant to just listen the first time and then read aloud with the interventionist the second and third time. After the third reading, the interventionist prompted the participant to move to a nearby computer, click on the voice recorder, and commence with recording easier level passage #1 and unfamiliar grade level passage #2 on their own. When recording the repeated readings, she followed a natural pattern of

alternating between keeping her eyes on the text and occasionally looking up at the camera. She deliberately behaved in a similar fashion to the one-on-one sessions, maintaining a cheerful, positive attitude while modeling exemplary ORF. Videotaped passages were saved and viewed on the laptop computer used to create them. Individual recordings were labeled according to session numbers.

Participant Procedures During Videotaped Interventions

At least three times a week during each videotaped intervention phase, otherwise known as Phase C, the participant sat down at a designated computer, put on headphones, opened his or her notebook, and clicked on the arrow to begin listening to a recording of the interventionist. In the same manner as the one-on-one sessions, the videotaped sessions began with the interventionist prompting the participant to look at the Fluency Progress graph (see Appendix I) in his or her notebook and observe the results of the last session. After making note of the goal for improvement, the participant then turned to the copy of easier level passage #1.

Following the direction of the interventionist on the videotape, the participant progressed through the steps of listening (once) and repeated readings (twice) of easier level passage #1. Prior to beginning the listening stage, the interventionist prompted the participant to listen carefully to how each word was pronounced. During the listening stage, the participant kept his or her eyes on the words while listening to the interventionist read the passage aloud with exemplary fluency. At the conclusion of the listening stage, the interventionist prompted the participant to begin reading aloud with her, matching her pace and making the passage "sound just like I make it sound." When the passage was read one time completely through, the

interventionist quickly prompted the participant to read the same passage along with her again in its entirety. No explicit immediate error correction was provided because the session was prerecorded. Furthermore, immediate feedback would undermine the fidelity of implementation of the independent variable.

After the second oral reading, the participant was directed to pick up the notebook and move to the other computer to make the voice recordings. At this point the videotape automatically stopped, leaving it in position to be replayed by the next participant. Once the participant had arrived at the second computer, the procedure was the same as during the one-on-one sessions: The participant put on headphones with an attached microphone, clicked on the voice recorder, and recorded one final reading of easier level passage #1, and saved the recording under their own name as follows; "First name1," for example, "Mary1." When that was complete, the participant turned in the notebook to the copy of unfamiliar grade level passage #2 and recorded that on the computer as well, except this time the recording was saved as "First name2," for example, "Mary2." At no time were participants permitted to pre-read grade level passage #2.

After recording and saving grade level passage #2, participants turned to the Daily Report (see Appendix J). Their final responsibility of the session was to fill out this short questionnaire, indicating how they felt about the session that day. When the Daily Report was completed, the entire notebook containing all hard copies was returned to the interventionist.

Interventionist Procedures During Videotaped Interventions

At least three times a week during each videotaped intervention phase, otherwise known as Phase C, the interventionist prepared the materials in the resource room for the upcoming session. She ensured that the student notebooks contained the necessary hard copies of instruments, and placed them on the same table each time. The interventionist turned on the computer used for delivery of the videotaped intervention, plugged in the headphones, and clicked on the copy of the videotape to be used that day so that the file was open and ready to go. She turned on the other computer (used for making voice recordings) and plugged in the headphones with microphone attached. These same two computers, and only these two computers, were used for the same purposes throughout the study.

When the first participant entered the room, the interventionist directed him or her to sit down at the computer with the videotaped intervention and begin. At this point, the interventionist left the first participant to work independently and positioned herself in the room so that she could easily observe the participant following along with the videotaped intervention. She did not interfere except to occasionally remind the participant to read a little louder or keep their eyes on the page. When the first participant completed the videotaped portion and moved to the second computer to make their voice recording, the interventionist called on another participant to begin listening to the videotape. The subsequent interventions proceeded in the same manner as before, with the interventionist following the aforementioned steps with each new participant.

While the participants were interacting with the videotape and recording their oral readings, the interventionist closely observed the process and completed the Daily Log (see

Appendix K). She occasionally interacted with the other students when they had questions about other learning centers, but primarily remained detached, in the role of an observer, since during the one-on-one sessions she had limited opportunities to provide such interaction. This step was taken in order to maintain fidelity of implementation of the independent variable.

When all participants completed the intervention and returned to their classrooms, the interventionist listened to the recorded passages, scoring each recording for both rate and accuracy, and recorded the data on a hard copy scoring report which was then transferred to a Microsoft Office Excel spreadsheet. The hard copies of scoring reports were coded for identification and stored in a locked filing cabinet along with the hard copies of the Fluency Progress graphs and Daily Reports collected from each participant that day. The interventionist transferred the audio recordings to a password-encrypted USB jump drive designated solely for this purpose, and then deleted the recordings from the computer desktop used by the participants. Prior to copying each recording she renamed each file as Student 1, 2, 3, or 4 in order to protect the confidentiality of the participants. Finally, the interventionist assembled hard copy materials for each notebook for the next day.

Reliability Measures

Independent Observer

The independent observer throughout the study was a National Board Certified teacher, holding certification in both Early Childhood Education and Elementary Education. She has taught for 21 years in grades kindergarten through fifth grade. The observer earned a Master's degree in Educational Technology/Media and is currently working toward a doctoral degree in

Curriculum and Instruction. According to Institutional Review Board requirements, the observer successfully completed coursework in the Protection of Human Research Subjects.

The observer was trained by the researcher on the background and procedures of the study prior to its inception. A series of meetings began with a one-hour session during which an overview of the study was presented. Present at this meeting were the researcher, the observer, the school principal, and the special education teacher. Subsequent meetings were held between just the researcher and the observer.

The independent observer had two primary roles in the study: She assisted in inter-observer reliability checks on the scoring of the audio recordings created by the participants, and she checked for fidelity of implementation during the sessions. Both of these roles were conducted across 33% of the sessions.

Inter-Observer Agreement

Training for the scoring of audio recordings was accomplished by listening to and scoring passages from the first two sessions. The observer was previously experienced in the use of standard scoring procedures for ORF, so the only training required for this role was practice in using the instruments. During each session the four participants each recorded two passages. Therefore observer practice for the scoring procedures occurred across eight recordings for each of the two initial sessions.

An a priori decision was made to achieve 100% inter-rater agreement by using the following procedures: First, the observer and the researcher both secured blank copies of the scoring reports for both easier level passage #1 and grade level passage #2. Then the recording of

each participant was played aloud for both the observer and the researcher to listen to at the same time. The observer and the researcher both recorded the scoring reports for errors they heard. Errors included any word mispronounced within the context of the sentence, word omissions, words read out of order, and word substitutions. If an error was corrected within three seconds it did not count as an error. At the conclusion of the recording, scoring reports were compared to establish agreement on errors as well as agreement on the last word stated within the one minute time limit. If any disagreements were reported, the recording was listened to again and again until agreement was reached. Both listeners established agreement on the total number of words read correctly and filled out the bottom of the scoring report (Appendix G and Appendix H), indicating the agreed-upon WCPM and EPM measurements. In order to minimize fatigue, inter-rater agreement measurements were always conducted on recordings of all four participants from just one session at a time.

Training for fidelity checks was accomplished by introducing the observer to the interventionist (see Appendix M) and participant (see Appendix L) procedural checklist instruments for both the one-on-one and videotaped sessions. Once the procedure for the use of these checklists had been explained by the researcher to the observer, the observer practiced the use of the instruments on the first two sessions so that by the third session she was skilled at observing both the interventionist and the participants for their adherence to established procedures. As stated previously, a fidelity rating of at least 95% was the desired goal of this study (Kazdin, 1982).

Validity Measures

Through careful design, single-subject studies can diminish threats to internal validity, which might otherwise impede the researcher's ability to make inferences based on the study's results (Kazdin, 1982). Threats to external validity, or ability to generalize the results of the study to other situations, have been addressed in this study through careful descriptions of the participants, setting, instrumentation, and procedures.

Social validity is an evaluation of the social relevance of providing interventions (Kazdin, 1982; Wolf, 1978). The concept of social validity was first described by Wolf as a measure of the social significance of the goals, the social appropriateness of the procedures, and the social importance of the effects when conducting applied research (Wolf, 1978, p. 207). Schwartz and Baer (1991) recommend that measurements of social validity begin by collecting consumers' viewpoints, followed by an analysis of responses in order to design interventions which are acceptable and valued by consumers. In other words: If results of an intervention are not valued by society, then the usefulness of results is diminished.

The initial conceptualization of social validity constructs was controversial due to the subjective nature of measurement techniques (Wolf, 1978). Over the ensuing years, increased awareness of the critical link between consumer perceptions of relevance and ultimate implementation of procedures has been noted by researchers (Papalia-Berardi & Hall, 2007). Subjective evaluation, in which participants' perceptions of interventions are collected and analyzed (Kazdin, 1982), was used in the current study as a construct of determining the social validity of providing the intervention. A structured interview (Appendix P) of individual participants was conducted by an independent observer. Each interview was audio recorded,

coded, and transcribed. Recordings were destroyed to protect confidentiality of participants. Transcriptions were analyzed for common themes and overall perceptions of the two methods of intervention delivery.

Additional social validity measures included comparisons of beginning and ending Lexile measures for each participant. Comparisons add to the discussion about the connection between ORF rates and reading comprehension. The Daily Logs, completed by the interventionist, and the Daily Reports, completed by the participants, were also analyzed and compared to passage scoring reports to see if any correlations could be made between observed/perceived behaviors and dependent measurements taken on the same day.

Data Analysis

As in any single-subject design, data were collected on a target behavior individually for each participant and results were compared to allow the researcher to make overall judgments based on observable patterns of behavior (Kazdin, 1982). The line graph created for each participant was analyzed through visual inspection across phases specifically looking at the mean of scores within each phase. For each individual participant, the researcher compared means of WCPM measures across phases in order to determine if both methods of delivery continued to show the positive growth in WCPM means that would be expected during continued repeated reading interventions (Samuels, 1979). Likewise, comparisons of mean EPM were conducted across phases, again looking for improvements in accuracy that would be expected during continued repeated reading interventions (Herman, 1985). Data on inter-observer agreement rates were reported based on corresponding scoring reports between the interventionist and the

independent observer. Fidelity of treatment data were reported based on results of both the student procedural checklists and the interventionist procedural checklists. Lastly, qualitative data collected during participant interviews were analyzed and discussed as an element of the social validity of the study.

Summary

The field of special education has for many years recognized the importance of single-subject research for providing data on the impact of interventions on individual learners (Horner, et al., 2005). These learner-focused studies provide a critical foundation for further special education research. The complex nature of both the participants and the context of their special educational services can be carefully detailed in a single-subject design study, yielding results which may facilitate replication by practitioners in ways that other research designs may not (Odom, et al., 2005). In this chapter, replication has been facilitated by providing detailed descriptions of participants and procedures. Therefore, the potential exists to improve the knowledge base for future researchers seeking alternative procedures for positively impacting academic outcomes for disfluent intermediate students with LD.

CHAPTER 4
RESULTS

Introduction

This chapter reports on the results of data collected throughout the study. Quantitative and qualitative information are both reported as they pertain to each question. Social validity, inter-observer agreement, and fidelity of implementation of the study are presented prior to summarizing the results.

The study was conducted using a single-subject alternating-phases (ABCBC) design. Data were collected from each of the four participants as follows: After a baseline of three data points (A), one-on-one delivery (B1) of the repeated reading intervention was implemented, and nine data points were collected. Immediately after that, nine data points were collected during the videotaped delivery phase (C1), followed by a repeat of one-on-one interventions (B2) and then a repeat of videotaped interventions (C2). A total of three baseline data points and 36 intervention data points were collected for each participant. Additionally, qualitative data were collected at the conclusion of the study through the administration of a structured interview with each participant.

Time required for completion of data collection was 12 weeks, spanning from February 2009 to May 2009. This included time spent collecting all 36 intervention data points, with two days missed during the Florida Comprehensive Assessment Testing (FCAT) window in early March and one week missed in early April for spring break. This did not include the baseline period. Intervention sessions were held at least three and sometimes four times per week, with

the only exception occurring during the first week (interventions began on a Thursday) and the week of FCAT, when only two sessions were held each week.

From the interventionist's perspective, the process of engaging one-on-one with a student took about eight minutes each, for a total of about 32 minutes of instructional time per day. As soon as the interventionist finished reading with one participant, she directed him/her to move to the computer to record the assessment. At that point, the interventionist immediately went on to the next participant. Each one-on-one session was, therefore, completed within the 35-minute allotted instructional time period.

The process of engaging in the videotaped intervention took essentially no instructional time on the part of the interventionist. For the purposes of the study, the interventionist used this time to observe and refrained from engaging in additional student instruction. Each videotaped session was also completed within the 35-minute allotted instructional time period.

After the participants left the room, during both B and C phases, the interventionist took an additional one minute per student to record observations in the Daily Log. She then prepared for the next day's session.

Preparation time required by the interventionist for each one-on-one session took about 45 minutes of non-instructional time each day. This included time spent organizing materials for both the students' notebooks and the interventionist's notebook, listening to audio-recordings of each student's daily readings, completing scoring reports, and updating individual Fluency Progress graphs.

Preparation time required by the interventionist for each videotaped session took about 60 minutes of non-instructional time each day. This included time spent organizing materials for

both the students' notebooks and the interventionist's notebook, listening to audio-recordings of each student's daily readings, completing scoring reports, updating individual Fluency Progress graphs, and pre-recording the next day's session. The portion of that hour of preparation devoted to video recording was about 15 minutes.

Research Question 1: Impact on Fluency

The first question addressed in the current study was: When individual fifth-grade students with learning disabilities receive repeated oral reading interventions, to what degree, if any, does the number of words read correctly per minute increase? All four participants demonstrated overall growth in ORF measurements. Results are shown numerically in Table 3 below.

Table 3
Mean and Percentage Increase in Words Correct per Minute (WCPM)

Participant	Words Correct per Minute (WCPM)		Total Mean	Percent Increase
	Baseline Mean	Post-Study Mean	Increase WCPM	Mean WCPM
Student 1	104	148	44	42
Student 2	98	142	44	45
Student 3	72	90	18	25
Student 4	87	115	28	32

Mean results were calculated by first adding all three data points for each participant in the baseline phase (A) and dividing by three in order to find the baseline mean WCPM. The post-study mean WCPM was found by adding the last three data points collected (sessions 37 – 39), and the resulting sum was divided by three. The baseline mean was subtracted from the post-study mean to determine the total mean increase WCPM. Increases expressed as a percentage are shown in the final column. Percent increases were calculated by dividing the total mean increase

WCPM by the baseline mean WCPM. Results are also visually depicted as a bar graph in Figure 1.

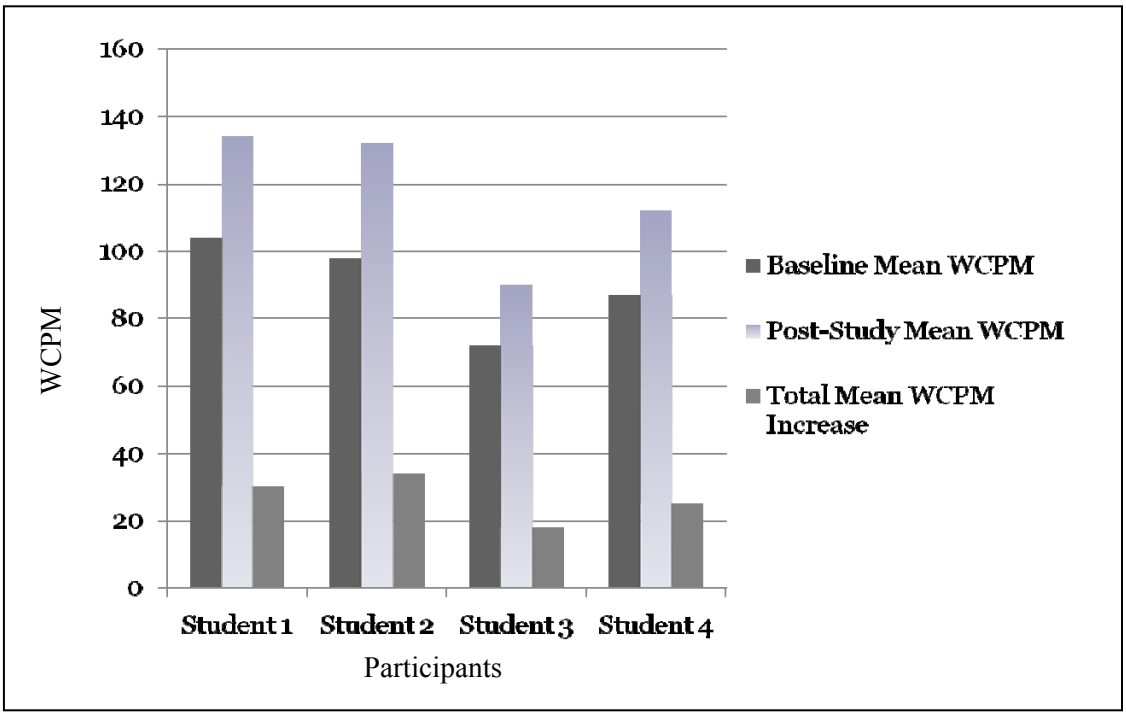


Figure 1. Mean Increase in Words Correct Per Minute (WCPM)

Summary of Research Question 1

Repeated reading interventions can be expected to produce improvements in reading rate of 25% (Samuels, 1979). Using this criterion, all four participants demonstrated increases in WCPM rates that would be expected through the use of repeated reading interventions. Evidence of this growth is presented in Table 3. Student 1 and Student 2 demonstrated increases far beyond what would be expected.

According to Hasbrouck and Tindal (2006) a score of ten words below the 50th percentile on the WCPM norms chart should be interpreted as an appropriate reading rate for each grade

level. For fifth-grade students at the end of the school year, that measurement would be 129 WCPM. Student 1 and Student 2 both achieved the goal of increasing their WCPM rates to an appropriate level for the end of fifth grade. Student 3 missed the goal by 39 words, and Student 4 missed the goal by 17 words. Evidence of individual growth is presented in Table 3.

Research Question Two: Fluency Results by Method

The second question addressed in the current study was: Does a one-on-one delivery method or a videotaped delivery method lead to more rapid increases in ORF measurements for individual fifth-grade students with learning disabilities? The following sub-questions were addressed:

a. To what degree, if any, does the number of words read correctly per minute increase for the participants while using each approach?
b. To what degree, if any, does the number of words read incorrectly decrease while using each approach?

Data are presented in response to these questions according to each individual participant. A visual representation of data, including trends and means within phases, is presented first in Figures 2, 3, 4, and 5. Finally, Figure 6 summarizes for all four participants the range of scores found in both of the dependent variables across the four intervention phases of the study. Tables containing all dependent measurements for each participant can be found in Appendix Q. It should be noted that all graphs represent CBMs taken when the participants read aloud grade level passage #2. At no time are data depicted from reading easier level passage #1.

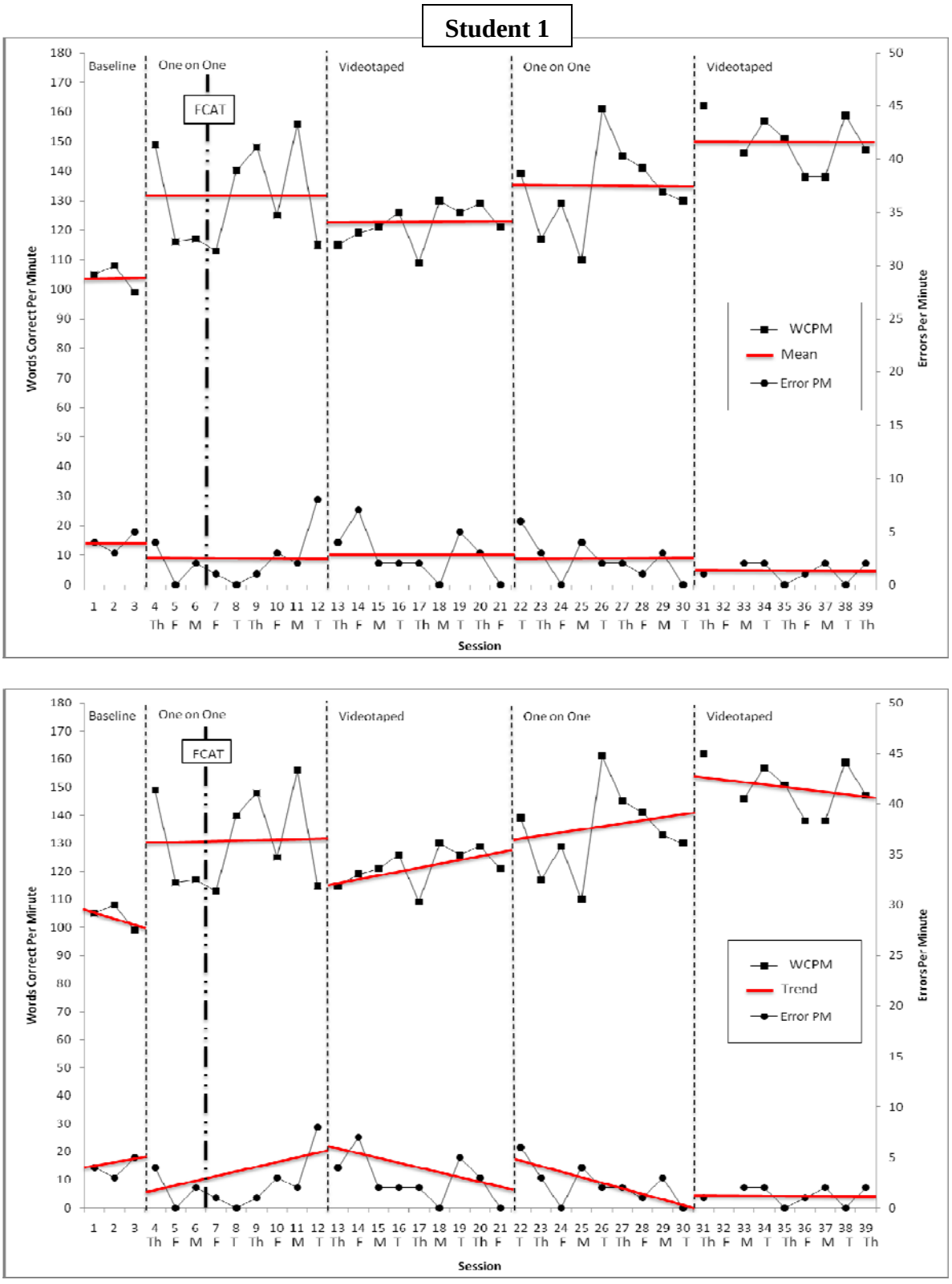


Figure 2. Student 1/Trends and Means of Curriculum-Based Measurements

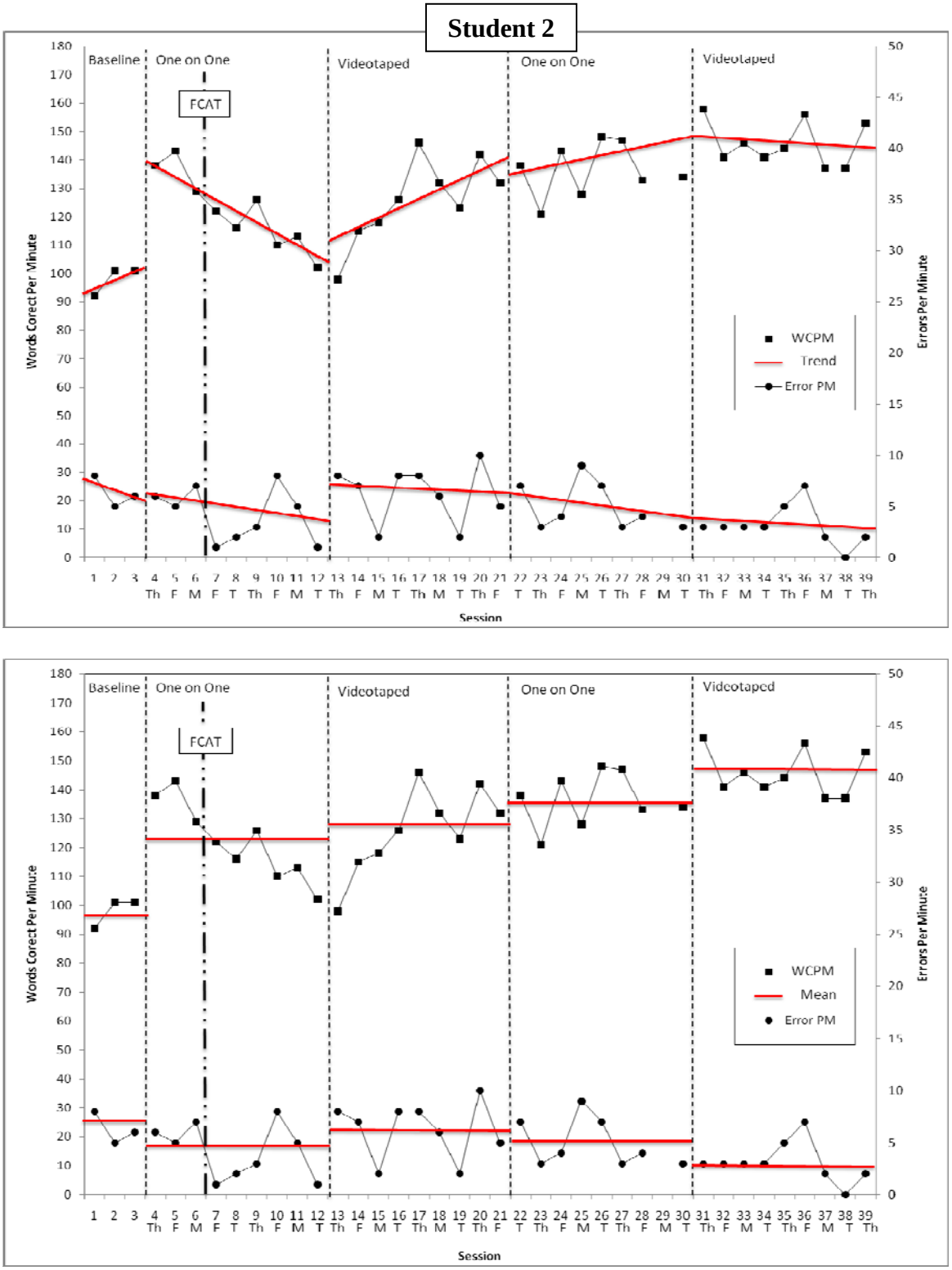


Figure 3. Student 2/Trends and Means of Curriculum-Based Measurements

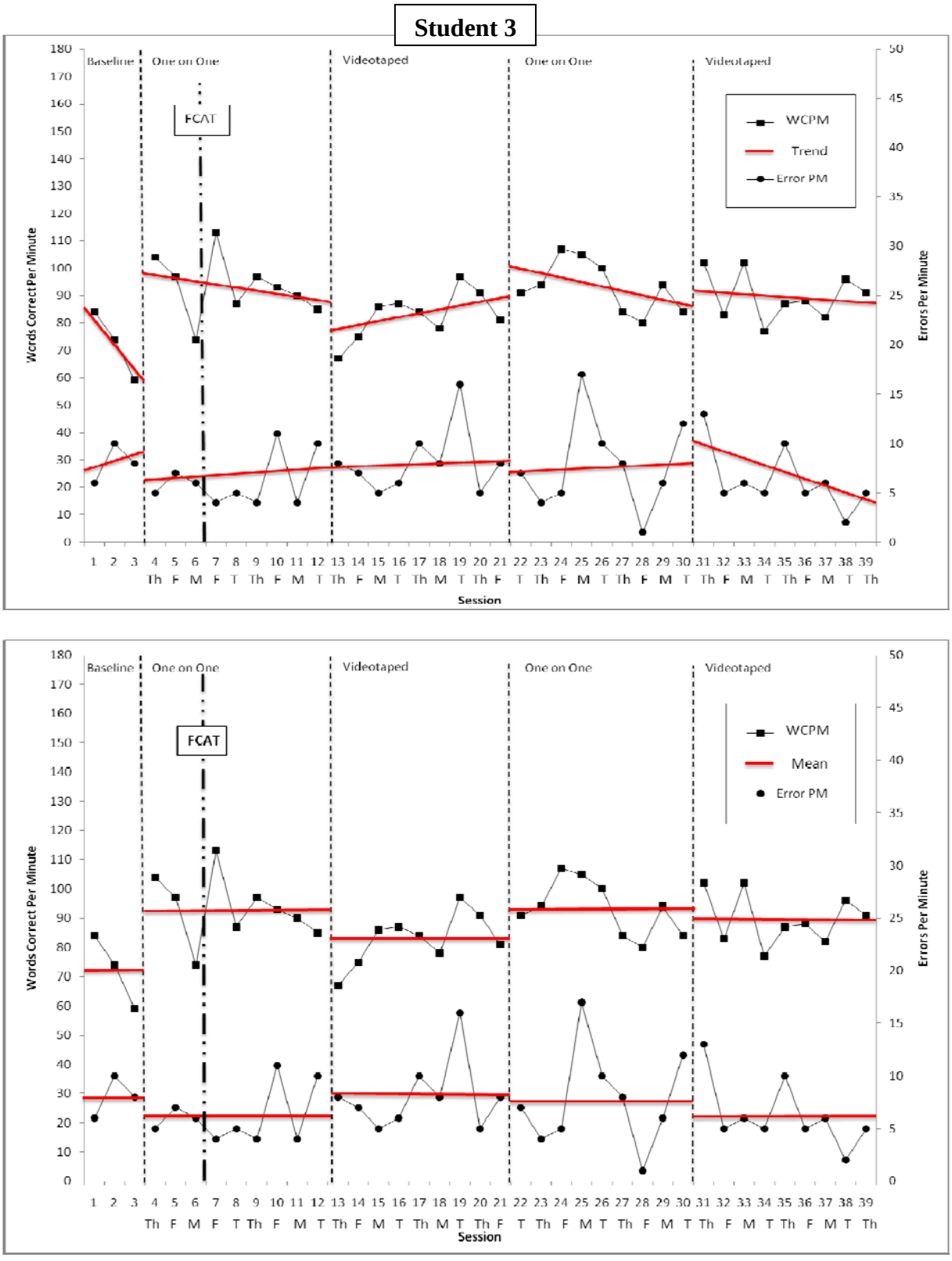


Figure 4. Student 3/Trends and Means of Curriculum-Based Measurements

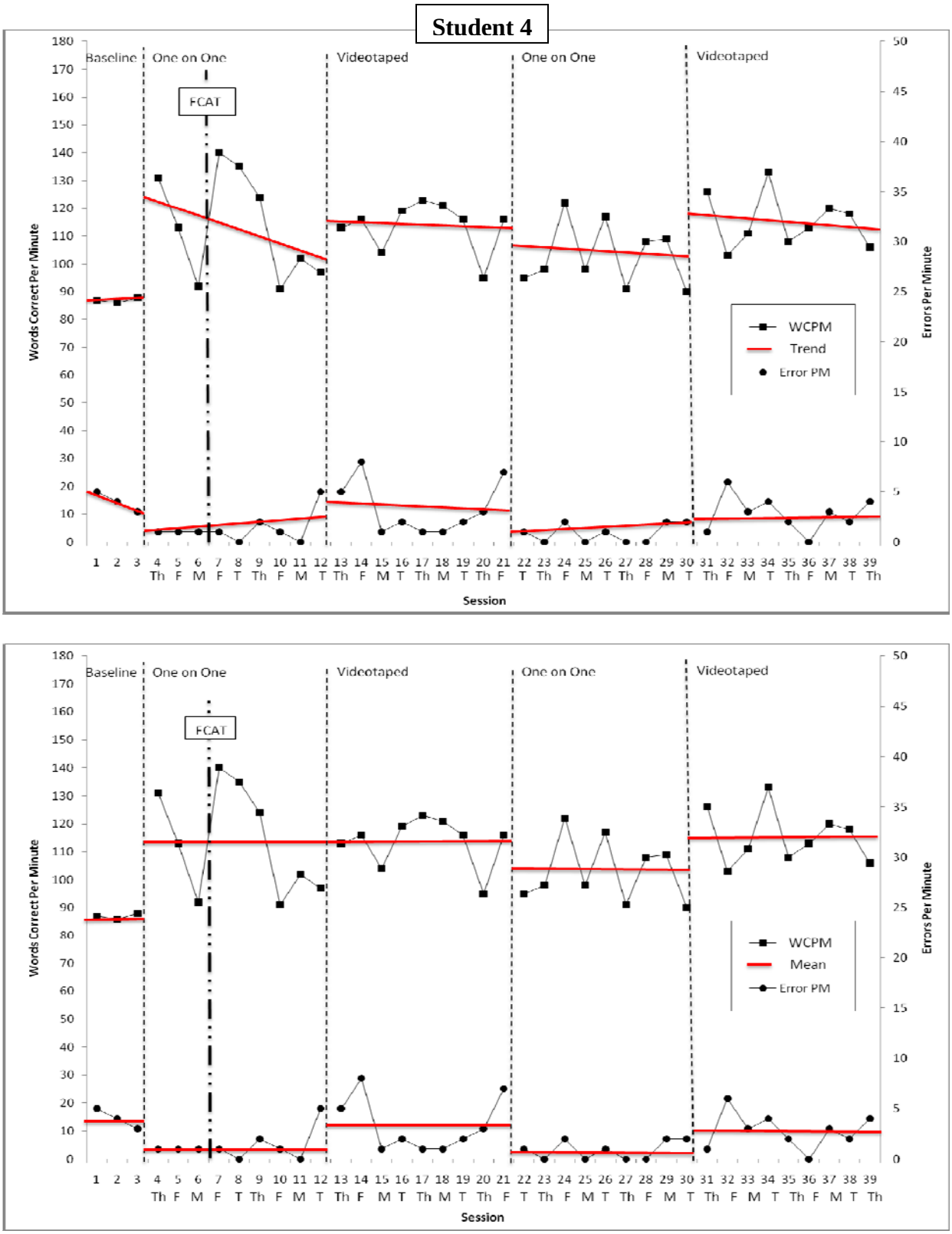


Figure 5. Student 4/Trends and Means of Curriculum-Based Measurements

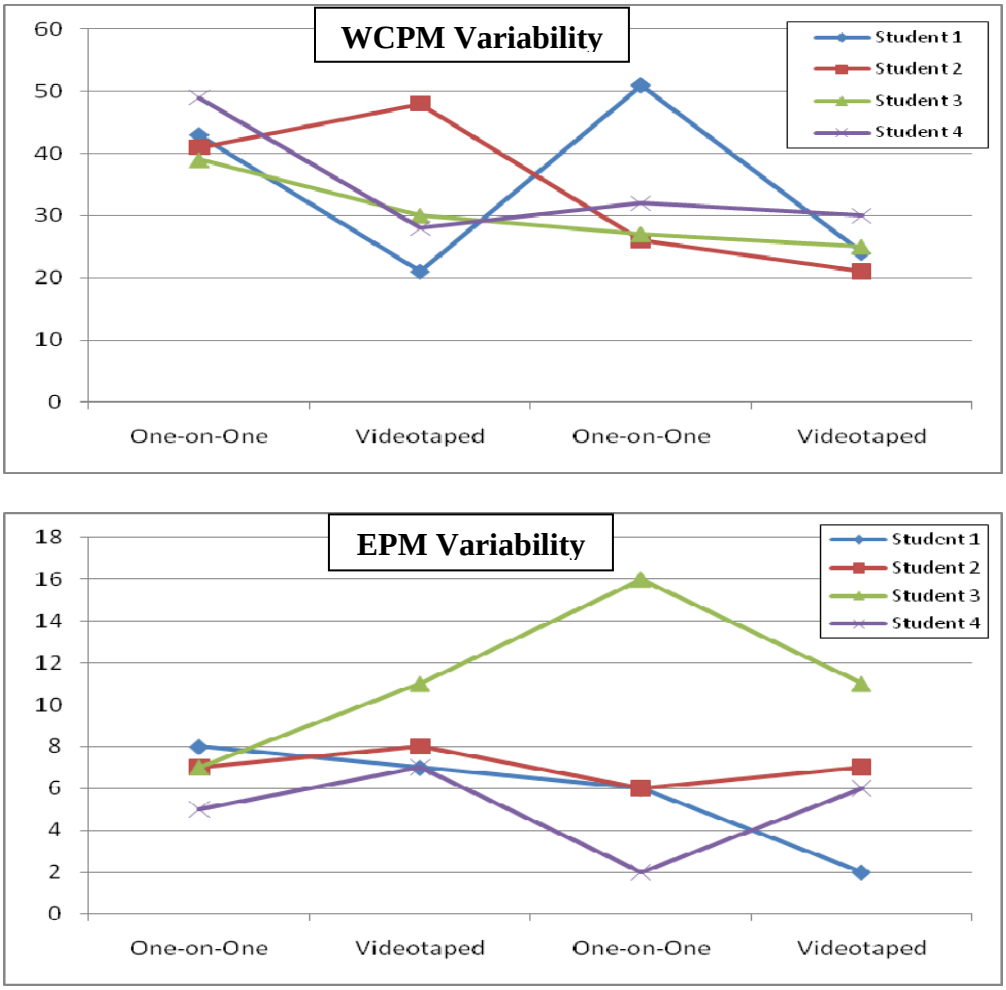


Figure 6. Variability of Curriculum-Based Measurements

Student 1: Fluency

As shown in Figure 2, Student 1 established during baseline that he was reading below grade level norms for ORF. When one-on-one interventions began, an immediate potential novelty effect was seen as data point four was 149 WCPM, a score that was higher than his post-study mean of 148.

A visual inspection of trend lines across the four phases of intervention show that Student 1 slowly increased his WCPM measurements in the first one-on-one phase (B1) followed by a faster rate of growth in the first videotaped phase (C1), continued growth at about the same rate when interventions returned to one-on-one (B2), and a gradual decline in the final videotaped phase (C2). Looking at the corresponding error per minute (EPM) trends, it becomes apparent how the trends in errors tend to mirror the trends in words read correctly. For example, in session 12 when he recorded his highest rate of errors during the study (8), the student's corresponding level of WCPM (115) dropped markedly. Overall, his trends in errors followed a pattern of up, down, down, steady with no one type of intervention appearing to be superior to the other in terms of improvement in rate of errors. In summary, Student 1's only downward trend in WCPM was in the final videotaped phase, but the first videotaped phase provided a rate of increase that was nearly identical to that of the one-on-one phase that followed (B2).

An examination of mean WCPM measurements in each phase shows Student 1 achieved grade level means (129) in both one-on-one phases (131 WCPM in phase B1 and 134 WCPM in phase B2). He dropped back below grade level (122) in the first videotaped phase but recorded his highest mean WCPM scores (150) in the final videotaped phase. As for EPM, again no one method of delivery demonstrated better mean error rates, yet overall improvements in mean EPM are visually evident. Figure 6 shows a steady improvement in the range of errors recorded for Student 1. Interestingly enough, one can also see in Figure 6 a marked preference toward less variation in WCPM scores during the videotaped phases.

Student 2: Fluency

As shown in Figure 3, baseline measurements of WCPM for Student 2 demonstrated a condition of disfluency. Similar to Student 1, a potential novelty effect can be seen during initial one-on-one interventions as his WCPM scores jumped up high and then immediately began to fall. Rates of WCPM did not begin to improve again until the second session of the first videotaped phase (C1), after which he experienced his most rapid rate of increase during the study. That increase continued into the subsequent one-on-one phase (B2) with the final videotaped phase showing a slight decline of WCPM scores. The error rate demonstrated by Student 2 showed a declining trend throughout the study. Similar to what was noted about his WCPM measures, a significant change in EPM occurred for Student 2 between the first one-on-one phase (B1) and the first videotaped phase (C1). An examination of WCPM score variability, as shown in Figure 6, shows that his highest range of scores was during this first videotaped phase. After that, he showed marked improvement in reducing the amount of variance in WCPM rates, while his range of EPM scores remained relatively stable throughout the study.

An analysis of the means of the different phases for Student 2, shown in Figure 3, reveals a gradual increase in mean WCPM over time. The final videotaped phase most definitely provided the largest increase in mean WCPM scores, as well as the largest decrease in EPM scores.

Student 3: Fluency

Figure 4 provides a visual depiction of ORF changes for Student 3 during the current study. Baseline measures established an initial condition of disfluency, and a potential novelty

effect can be seen once interventions began. An examination of trend lines in WCPM scores reveals decreasing trends in both one-on-one phases, an increasing trend in the first videotaped phase, and a slightly decreasing trend in the final videotaped phase. Corresponding EPM scores show steadily increasing trends in the rate of errors throughout the study, until the final videotaped phase when for the first time the EPM measures showed a tendency to decline.

Visual inspection of changes in the WCPM means across phases shows a pattern of up, down, up, down, with a slight preference toward higher means during one-on-one phases. Comparing these means to the corresponding EPM means reveals that with the exception of the final videotaped phase, whenever Student 3 decreased his mean rate of EPM, his corresponding WCPM rate would increase. During the final phase C2, his WCPM mean decreased slightly but so did his mean rate of errors, almost matching that of his initial EPM mean in the first one-on-one phase of intervention (B1). Overall, Student 3 demonstrated by far the highest rate of errors of the four participants.

Figure 6 shows that Student 3 began the study with a high variance in his measures of WCPM, and as the study continued, he gradually improved by decreasing the range of his scores. A visual analysis of the variance of his error rate however shows that he finished the study with a greater range of EPM scores than when he began. The variance peaked during the second one-on-one phase with scores that ranged from a low of one error in session 25 to a high of 17 errors in session 22. Interestingly enough, this high rate of 17 errors was in the session immediately following his second-best WCPM rate, raising the question of whether pressure to match that score a second time led to so many mistakes.

Student 4: Fluency

Figure 5 indicates a steady, low WCPM baseline for Student 4 and, similar to all other participants in the study, a significant potential novelty effect once the one-on-one interventions began. Trend line analyses for Student 4 reveal that she experienced declining trends in all four phases of intervention, with the most significant rate of decline occurring in the initial phase B1. Likewise, she demonstrated increasing trends in EPM rates in all phases except the first videotaped phase where her rate declined slightly.

A possible explanation for Student 4's universally declining trends in WCPM can be found by examining the means of each phase and combining that information with her variance of scores. Her first two phases, one-on-on (B1) and videotaped (C1) posted the exact same mean of 114 WCPM. She dropped slightly in WCPM means for the second one-on-one phase (B2) but then returned to her highest mean of 115 in the final videotaped phase (C2). Overall, Student 4 did not experience great changes in her mean WCPM after the study was underway, and no single method of intervention appeared to elicit superior performance. However, Figure 6 reveals that Student 4 began the study with a high variance of WCPM scores that persisted throughout the first two phases (B1 and C1) and then dramatically decreased and remained low for the final two phases (B2 and C2). Analysis of EPM variability reveals the same high variance in the first two phases (B1 and C1) and almost no variance (only a two-word difference) in the second one-on-one phase (B2) but an eventual return to the higher (six-word) initial variance in rate of errors in the final videotaped phase (C2).

Student 4 generally did not make many errors when reading aloud. Figure 5 shows that once interventions began, she had very low mean EPM scores during both one-on-one phases

(1.3 during phase B1 and 0.8 during phase B2). Her individual EPM scores always jumped up just before and just after the switch to videotaped interventions was made. In fact, at the end of every phase, her EPM rate showed an increase just prior to starting something new.

Summary: Research Question 2

Does a one-on-one delivery method or a videotaped delivery method lead to more rapid increases in ORF measurements for individual fifth-grade students with learning disabilities? Results indicate that all four participants demonstrated some degree of ORF improvements throughout the study. In fact, all four participants clearly showed instances where one-on-one interventions led to improvements in ORF measures, and all four participants clearly showed instances where videotaped interventions led to improvements in ORF measures. The analysis of data does not indicate that one method of intervention is superior to the other for all four individuals. However, an analysis of trends, means, and variances of dependent measures does reveal nuances in individual responses to each form of repeated reading intervention.

Research Question 3: Participant Preferences

The third question addressed in the current study was: Which approach, one-on-one or videotaped, do the participants prefer? To answer this question, participants were interviewed by the independent observer at the conclusion of the study. The format used was a structured interview (Appendix P) so that all four participants were asked the same questions. The interviews were audio-recorded and transcribed, and the researcher analyzed the transcriptions to look for common themes and overall perceptions of each individual participant (Marshall & Rossman, 2006).

At the beginning of the interview, each participant was asked if he or she would like to listen to a recording of themselves reading from one of the first recorded sessions in the project as well as a recording from one of the last sessions. All four participants said yes; they did want to hear themselves read. It should be noted that the rest of the interview questions were answered immediately after hearing these recordings. In order to best address the research question, a narrative of individual participant responses will be presented, followed by Table 4, which consolidates and further summarizes the responses of all four participants.

Student 1: Preferences

Student 1 felt that he did improve his ORF by reading faster. He felt good about looking at his Fluency Progress graph each time and believed that having the goal helped him read faster to get to that goal so that he could then have a new goal. He considered the passages to be "just right…sometimes too hard and sometimes too easy," and he could tell that the harder ones took longer to finish.

Student 1 liked the one-on-one method the best and felt like it helped his ORF the most. He said he liked one-on-one because it "is like someone is there; it makes it feel more right. The videotape felt like nobody was there." Furthermore, he thought the videotaped method was harder because "when you skip a line and get confused you can't tell her to stop." The one-on-one sessions seemed to take longer in Student 1's opinion, and he particularly liked them because "it was easier to follow along because you could always catch up or ask a question."

When asked if he had anything else he would like to add, Student 1 had this to say:

> The video one would be easier for teachers because they wouldn't have to read – they could just record at the beginning of the month and then all the kids

> that need to get their fluency better, they could just go into the closets or downstairs or somewhere else, like the library. And it would be easier for the teachers to do that because they wouldn't have to get someone else to watch them while they do fluency.

Student 2: Preferences

Student 2 felt that he improved his ORF by reading faster. When he looked at his Fluency Progress graph each time, he noticed that it kept changing and he did not believe that he would have improved as much if he did not have the graph to look at each time. He believed that the goal helped him with reading harder passages. He noticed that some passages were "a little difficult" and some were "just right."

Student 2 liked the videotaped sessions the best because he felt it made reading easier. "When I am reading with someone else, I get confused with the words." For this reason, the one-on-one sessions seemed the hardest to do, and he thinks the videotaped sessions helped him improve his ORF more. In his opinion, the videotaped sessions took longer because they were slower and it was easier to keep up with the teacher. When asked if there was anything he particularly liked about either method, he replied "I liked the videotaped because it was much easier for me to concentrate."

Student 3: Preferences

Student 3 felt that his ORF improved because "before when I was reading, I read a really low number of words per minute. Now I can read more words in a minute." When asked how he felt about looking at his Fluency Progress graph each time, he said "I felt good when it went up and when it went down I felt like I could do more work on my reading." He liked having the

graph so that he did not forget how he had done the day before. He mentioned that it helped to be able to see that, and having the goal helped as well. "With the goal – I tried my best to read fast so it helped my rates go higher."

When asked to tell anything he noticed about the passages, Student 3 replied "The passage was what we were learning with school textbooks. Sometimes they were hard, sometimes they were easy, sometimes they were in the middle."

Student 3 liked the videotaped sessions most, although he felt they were the hardest:

> I liked the videotape because I think the videotape was kinda cool. And you can hear the teacher; you can raise the volume if you want. With a regular teacher you can't raise the volume. When you read with the teacher it is more easier. With the videotape you read but you make more mistakes as you are reading.

Student 3 felt that the one-on-one sessions helped him improve his ORF the most (even though he liked the videotaped best) because "if you mess up, the teacher can tell you to read over again, but since it is recorded on the videotape the teacher can't tell you." He felt it was easier to keep up with the teacher during one-on-one sessions because "with the videotape she just reads at her regular pace. If it is too hard, she can't do anything about it. But with one on one if you are kind of behind she slows down for you."

Lastly, when asked if there was anything he particularly liked about either method, Student 3 replied that he liked "the one-on-one because you could read with her at the same time you talk to her. You can't talk to a computer."

Student 4: Preferences

Student 4 felt that her ORF improved during the time she participated in the study. "By me reading it over and over it bumps up my fluency and I feel great about that!" She responded

positively to the fact that she could see her goal on the Fluency Progress graph at the beginning of every session: “I felt good about it (the graph) because my goals were on there and each time I beat it I felt like I was doing really well.”

When asked to think about the passages and reflect upon them she replied; “Some were hard – some had tough words in them. But not all, some were hard and some were easy. Some of the stuff I didn’t really know and some of the words I didn’t know at all and some of them I just didn’t understand.”

Student 4 liked the one-on-one sessions best “because in the beginning and end she repeats some stuff over and over again. With one-on-one she goes right to it and she knows I know what to do so she just sends me right to it so I can get done right away.” She also felt that the videotaped sessions were more difficult because “sometimes it was just hard to listen.” In spite of this, she believed that the videotaped sessions helped her improve her ORF the most. “Ever since I started doing videotaped, I’ve been beating my goals. When I was doing one-on-one, I didn’t actually get a chance to beat my goals.”

When asked to think about which sessions were easier to keep up with, she replied; “One on one – sometimes on the computer when she is reading too fast I can’t tell her if she is reading too fast or too slow, but one-on-one if she is reading really fast I can tell her ‘I can’t keep up’ and she will slow down.” As to whether or not anything bothered her about either method, Student 4 noted that the headphones could “get irritating.”

Lastly, when asked if there was anything she particularly liked about either method she responded “I liked the videotaped because it is actually kind of cool to see her (the teacher) on the screen! But in the one-on-one it is actually kind of fun to read with her.”

Summary: Research Question 3

Table 4 contains a summary of the student responses to interview questions.

Table 4
Summary of Student Preferences

Questions	Student Responses
Do you think you improved your ORF?	All four said yes; they think they now read faster.
How did you feel about looking at the Fluency Progress Graph?	All four were positive--all four agreed that having a goal motivated them to improve.
How did you feel about the passages?	All four said some were hard, some were easy.
Which method did you like best--videotaped or one-on-one?	Students 1 and 4 liked one-on-one best. Students 2 and 3 liked videotaped best.
Which method did you think was hardest?	Only Student 2 thought that one-on-one was hardest.
Which method seemed to take more time?	Students 2 and 3 thought that videotaped took longer.
Which method was easier to keep up with the teacher when she was reading?	Only Student 2 thought that videotaped was easier to keep up with the teacher.
Was there anything that bothered you about either method	Student 1 said, "The videotaped felt like no one was there." Student 4 said the headphones used during the videotaped sessions were irritating.
Was there anything you particularly liked about either method?	Student 1: One-on-one was easier to follow along." Student 2: videotaped was easier to concentrate." Student 3: You can't talk to a computer," but you can raise the volume if you want." Student 4: Liked both--videotaped was "cool" but one-on-one was kind of fun to read with her, and I can tell her to slow down."

Social Validity

Social validity is an evaluation of the social relevance of providing interventions (Kazdin, 1982; Wolf, 1978). Our society needs a literate workforce. Curriculum-based measurements of ORF are regarded as critically important indicators of reading proficiency (Fuchs et al., 2001; National Institute of Child Health and Human Development [NICHHD], 2000). Therefore overall improvements in ORF, measured both quantitatively and qualitatively, are presented as evidence of the social validity of the study.

Prior to the inception of the study, all four participants read orally at a rate that was below the 50th percentile for the beginning of fifth grade (Hasbrouck & Tindal, 2006) and had, in fact, been below their grade level 50th percentile for most of their elementary school career. At the conclusion of the study, the post-study mean ORF measures indicated that both Student 1 and Student 2 had exceeded the 50th percentile level of 139 WCPM by achieving means of 148 and 142, respectively. Unfortunately, Student 3, with a post-study mean of 90 WCPM, and Student 4, with a post-study mean of 115 WCPM, both fell short of the 50th percentile goal.

Results of the participant interviews indicated that all four participants felt they improved their ORF by practicing repeated readings. All four participants also agreed that having a visual graph of progress and goals helped to motivate them to improve. Two participants (Student 1 and Student 4) liked the one-on-one method best. The other two participants (Student 2 and Student 3) liked the videotaped method best. However, only Student 2 thought that the one-on-one was the hardest, indicating that Student 3 (the student who showed the least improvement in mean WCPM measurements) actually preferred the method which he perceived to be the hardest.

The current study included the use of Daily Logs (Appendix K), completed by the interventionist, and Daily Reports (Appendix J), completed by the participants. The purpose of both of these instruments was to provide data on a daily basis on the social validity of the study. These measures enhance data collected on overall impressions recorded during the participant interviews at the conclusion of the lengthy twelve week study.

Data collected from Daily Reports are summarized for each participant in Appendix S. Results are disaggregated according to individual student perceptions of each method: one-on-one and videotaped. Overall, the results corroborate the sentiments expressed by participants during the structured interviews. When the Daily Report summaries are compared to the Summary of Student Preferences shown in Table 4, a few interesting details emerge.

Student 1 and Student 4 indicated during interviews that they liked the one-on-one sessions the best, yet on their Daily Reports they each gave higher marks for "overall impression" of a session to the videotaped sessions. Student 2 and Student 3 both indicated that they liked the videotaped sessions best during interviews. Daily Reports for Student 2 validated that choice. Daily Reports for Student 3 however gave more "Excellent" marks to the one-on-one sessions (11% of the total) and no "Excellent" ratings at all to the videotaped sessions, rating instead 100% of the videotaped sessions as "OK."

All four participants indicated during the interviews that some passages were easy to read and some were hard to read. This was corroborated by the Daily Reports. Interestingly enough, Student 3, who showed the least progress throughout the study, indicated the most often (22% of the total number of passages) that passages were too hard for him.

During the interviews Students 1, 2, and 3 all felt that it was easier to keep up with the teacher when she was reading in the one-on-one sessions than in the videotaped sessions. Yet on the Daily Reports, Student 1 never indicated that the teacher was reading too fast during the videotaped sessions, and instead indicated that during one-on-one sessions, the teacher sometimes (6%) read too fast and sometimes (6%) read too slow, reading just right during 94% of the 18 sessions.

Problems reported throughout the study were few. On only three occasions were any problems indicated on Daily Reports, and all occurred within the very first one-on-one phase. Student 1 and Student 4 each reported a problem with the headphones one time, and Student 1 reported a problem that occurred once when he was making a voice recording. All three problems were dealt with immediately and did not happen again. Student 4 referred to the headphone problem during her interview, indicating it was one of the reasons why she did not prefer the videotaped method.

Daily Logs maintained by the interventionist were also studied in comparison to individual sessions. The value of the Daily Logs was realized in the adult anecdotal evidence they provided throughout the study, which could be compared to evidence recorded by the students in the Daily Reports to either corroborate or refute the students' perceptions. For example, during the first two sessions in late February and early March, all four participants struggled with colds and allergies. Since this time period coincided with both a one-on-one and a videotaped phase, the effects of sore throats and stuffy noses were balanced evenly over both methods of intervention. Notations made on the affect of Student 2, a very quiet boy, indicated that his demeanor became more outgoing as the interventions proceeded. Likewise, the demeanor

of Student 1, who had attention-deficit/hyperactivity disorder (AD/HD) was recorded as sometimes hyperactive and sometimes not. Student 3 (who also had AD/HD) remarked during session 21 (the final session of the first video-recorded phase) that "sometimes I get distracted by background noise. When I look at just you (the teacher during one-on-one sessions), I can focus." During session 30 (one-on-one) Student 3 remarked that he liked the one-on-one sessions the best. "The computer one just doesn't feel right" he said. In that same conversation, he also reported that he liked reading Passage #2 better than reading Passage #1: "It is more interesting."

According to the Daily Logs, during session 19 (videotaped) Student 4 reported that she liked the videotaped sessions the best. "I think I do better" she said. On several occasions, remarks were recorded that indicated how much Student 4 enjoyed the opportunity to independently record her voice for all assessments. At one point about halfway through the study, the possibility arose for Student 4's family to move. Student 3 was very concerned about the effect this would have on the study. Fortunately, the move did not have to occur, and all four participants were present for the entire study, with the exception of two absences, one for Student 1 and one for Student 2.

At the beginning of the final videotaped phase (session 31), the interventionist recorded in the Daily Log at the conclusion of that session: "Entire session was very efficient. Students were very independent. Left me feeling like the morning was easy, quick, better overall contact with students."

A final measure of the social validity of the study is a comparison of pre- and post-Lexile measures. Lexile measures are computer-based assessments of a student's reading ability, which

can be used to match students with text written at the appropriate readability level (Fry, 2002; Lennon & Burdick, 2004). Results are indicated in Table 5.

Student 1 and Student 4 both moved out of the "Below Basic" performance standard for reading and into the "On Grade Level" category. Student 2 remained below grade level in the "High Risk" performance standard. Student 3 remained in the "Below Basic" performance standard reading below grade level.

Table 5
Participant Lexile Measures

Participant	Pre-Study Lexile	Post-Study Lexile	Percent Increase
Student 1	679	853	27
Student 2	565	604	7
Student 3	755	765	1
Student 4	761	782	3

Lexile measures of reading can be impacted by countless different aspects of reading instruction, and their inclusion in these results is in no way meant to indicate that this study was responsible for changes in these measures. Instead, Lexile changes are included because of the overall information they provide about changes in reading performance for each of these participants over the course of their fifth-grade experience. All four participants improved their reading skills this school year. Student 1 made the highest level of change. Student 4 made enough progress to qualify as a grade level reader, although her percentage Lexile measure change was quite small. Student 2, who demonstrated dramatic increases in ORF this year, continues to struggle with the comprehension skills assessed by the Lexile measure. Student 3, who made the least progress in ORF, also continues to demonstrate difficulty with reading comprehension.

Inter-Observer Agreement

A total agreement method was utilized for inter-observer agreement on the dependent variables. The independent observer conducted reliability checks on 33% of the recorded sessions, for a total of 12 sessions. The use of total agreement procedures resulted in a 100% agreement estimate for the reliability of the measurements. A schedule for the reliability checks is presented in Table 6.

Table 6
Schedule of Inter-Observer Reliability Checks

Session Number	Date	Agreement
4	2/26/09	100% (Practice)
5	2/27/09	100% (Practice)
7	3/06/09	100%
10	3/13/09	100%
13	3/19/09	100%
16	3/24/09	100%
19	3/31/09	100%
22	4/14/04	100%
25	4/20/09	100%
28	4/24/09	100%
31	4/30/09	100%
32	5/01/09	100%
34	5/05/09	100%
39	5/18/09	100%
TOTAL across 12 sessions		100%

Fidelity of Implementation

At the inception of the study, a fidelity rating of at least 95% was the desired goal. Using the Student Procedural Checklist form (Appendix L), the independent observer conducted fidelity checks on 33% of the sessions, for a total of 12 sessions. Each session had seven required tasks that students must complete. Student 1 completed 82 out of 84 observed tasks for a fidelity

rating of 97.6%. Student 2 completed 83 out of 84 observed tasks for a fidelity rating of 98.8%. Student 3 and Student 4 were both observed completing 84 out of 84 required tasks for fidelity ratings of 100%. Overall, the independent observer recorded 333 out of 336 required tasks were completed by the participants, resulting in an overall participant fidelity rating of 99%. Thus, the goal of at least 95% fidelity of implementation of participants was achieved.

The task skipped by Student 1 was task #3: "Turns to Passage #1 and listens and follows along." Student 1 did not perform this task during session 12 and session 29, both of which occurred during one-on-one phases. In both sessions, the observer recorded that Student 1 appeared to be "unfocused."

Student 2 did not perform task #2: "Turns to Fluency Progress graph and listens to review of progress and goal" during session 16, a videotaped phase. The observer recorded that he simply "skipped" this step. Tables providing details on the fidelity of implementation of all four participants can be found in Appendix R.

Using the Interventionist Procedural Checklist form (Appendix M) the independent observer conducted fidelity checks on the interventionist during 33% of the sessions, for a total of 12 sessions. Again, a fidelity rating of 95% was the desired goal. Each one-on-one session had five tasks that the interventionist was required to complete. Each videotaped session had six tasks that the interventionist was required to complete. The interventionist completed 64 out of a total of 66 required tasks. During session 16, a videotaped session, she did not complete task 6: "Does not intervene except to answer brief questions or encourage positive behaviors." Student 3 was having difficulty saving his voice recording so the interventionist assisted him. During session 30, a one-on-one session, the interventionist did not complete the same task as above

(labeled task 5 in one-on-one sessions). Student 4 was having difficulties with her headphones so the interventionist helped her switch to a new set of identical headphones. Overall, an interventionist fidelity rating of 96.9% was achieved, thus meeting the desired 95% goal. A table providing details on the fidelity of implementation of the interventionist can also be found in Appendix R.

Summary of Findings

Results of the current study provide a detailed description of how four individual intermediate students with LD responded when provided repeated reading interventions. Data on curriculum-based measures of rate and accuracy were collected while reading aloud after both one-on-one and videotaped delivery of interventions. Furthermore, evidence of the social validity of the study was presented not only through an examination of quantitative progress in reading skills, but also through participants' anecdotal responses to structured interview questions, giving voice to the characteristics of each individual student.

Research Question 1, regarding overall improvements in the number of words read correctly per minute, clearly was validated by the results. After analyzing transcripts of interviews and student comments on Daily Reports, the same can be said of Research Question 3. Comments expressed by participants throughout the study indicated the level of introspection they were each willing to strive for when contemplating their own preferences for the methods employed.

The second research question examined the impact of each of the methods of delivery for each of the participants. Results suggest that for Student 1, Student 3, and Student 4 a one-on-

one method of intervention produced the best overall results for improving ORF measures of rate and accuracy. Student 4 results favor the videotaped method.

Similar to other forms of instruction, what students prefer does not always align with what produces better results, but in this case, the fact that even one student (Student 2) both preferred and responded best to the videotaped intervention provides evidence of worthiness for further research on the use of a videotaped approach as an alternative to one-on-one interventions for intermediate elementary students with LD.

CHAPTER 5
DISCUSSION, RECOMMENDATIONS, AND CONCLUSIONS

Introduction

This chapter will draw conclusions on the results of the current investigation as they relate to the existing base of literature. Research in the areas of evidence-based interventions for improving oral reading fluency (ORF) for intermediate students with learning disabilities (LD) and the potential impact of effective reading teachers modeling best practices through both one-on-one and videotaped interventions will be discussed. Implications of the findings will be discussed as well as recommendations for future research bearing in mind the limitations of the current study.

The current study addressed three research questions: To what degree does the number of words read correctly increase for individual fifth-grade students with LD when they receive repeated oral reading interventions? Does a one-on-one delivery method or a videotaped delivery method lead to more rapid improvements in rate and accuracy for the participants? Which method of delivery do the participants prefer? In response to these questions, four fifth-grade students with LD participated in two alternating phases in an ABCBC single-subject design. One phase (B) utilized one-on-one repeated reading interventions conducted in person by an experienced, qualified teacher. The other phase (C) utilized a pre-recorded videotaped version of the same teacher following the same procedures. The study was conducted over the course of 12 weeks at a large Florida suburban elementary school in a resource room setting. Interventions were provided by the fifth-grade reading specialist, an experienced teacher of reading.

The two dependent variables were the grade level passage #2 reading rate and reading accuracy curriculum-based measurements (CBMs) taken during every intervention session. Reading rate was reported as the number of words read correctly (WCPM) in the first minute of oral reading. Reading accuracy was reported as the number of errors (EPM) made in that same minute. The two independent variables were the videotaped versions of the intervention and the one-on-one versions of the intervention, both of which featured the same interventionist following the same research-based procedures for improving ORF.

Conclusions are based not only on the quantitative curriculum-based measurements described above as the dependent variables. Also considered were the qualitative responses of the participants when queried about their experience.

Summary of Literature in Respect to Findings

Interventions for Students with Learning Disabilites

Students with LD should spend most of their day included in a general educational setting alongside peers who are non-disabled (McLeskey, Hoppey, Williamson, & Rentz, 2004), but some students with significant deficits may at times require more intensive instruction in a resource room setting. The students in the current study were included in general education fifth-grade classrooms for most of their school day, however their Individual Education Program (IEP) provided for resource room instruction as needed. Screening measures for ORF indicated that all four students were performing below grade level norms, so the decision was made to implement interventions designed to remediate this skill. The period of time required for providing interventions each day was brief, and materials utilized within the resource room

supported the science instruction implemented within the general education setting. Evidence of this support could be seen when Student 3 noticed that "the passage was what we were learning with school textbooks," and an examination of Daily Reports showed that on several occasions at the conclusion of the session students wanted to discuss the contents of the passage in greater depth in order to better understand the science content.

Literature supports the use of a multi-tiered framework for applying increasingly intensive research-based interventions, oftentimes referred to as response-to-intervention (RTI) (Chard et al., 2008; Davis et al., 2007; Linan-Thompson, & Hickman, 2003; Torgesen, 2002). Recommendations for further research into designing effective models for intervention for struggling students (Fuchs, Mock, Morgan, & Young, 2003; Speece & Walker, 2007) provided a rationale for the current study. This study involved participants who were previously identified as LD with the intent of providing a clearer picture of how individual characteristics of students with disabilities create unique circumstances which must be addressed when administering interventions (NJCLD, 2008). Prior to the inception of the current study, the participants had worked together in small-group intervention sessions aimed at remediating deficits the participants had in common; word identification and vocabulary skills. Intensity of intervention increased when the described one-on-one and videotaped interventions were applied in order to remediate another deficit they had in common; poor ORF skills. In the current study, distinctive results for each participant after administration of the same ORF interventions across participants underscores the importance of frequent individual progress monitoring for students with LD who participate in tier two or tier three interventions (Dion et al., 2004; Stecker & Fuchs, 2000; Wayman et al., 2007).

The literature is mixed on the duration and number of intervention sessions required to remediate skills for students with LD. O'Connor, White, and Swanson (2007) conducted a study with 15 minute interventions that occurred three times a week for fourteen weeks. Nelson, Alber, and Gordy (2004) described a study in which 33 sessions were held over the course of six weeks. Vaughn and Roberts (2007) however found that students receiving tier two and tier three interventions within an RTI framework generally make significant progress when provided 50 to 100 repeated reading intervention sessions. The current study described eight-minute interventions that occurred 3 or 4 times per week over 12 weeks for a total of 36 sessions. Obviously there is no hard and fast rule on frequency and duration of interventions, yet results of this study are expected to add to the literature base in this regard. In light of what is known about the complexity of cognitive processes required for fluent reading (Perfetti, 1985; Wolf & Katzir-Cohen, 2001) perhaps optimum timing and duration of interventions is another element of designing interventions that must be considered on a case-by-case basis for students with disabilities.

Oral Reading Fluency Interventions for Students with Learning Disabilities

The field of reading research has identified fluency as one of the essential components of quality reading instruction for all students (NICHHD, 2000). Prior to the inception of the current study, a comprehensive review of literature in the field of ORF interventions for intermediate students with LD was conducted. Two practices emerged as effective for remediating fluency deficits with this population; (a) audio-assisted repeated reading and (b) goal-setting with performance feedback (Chard et al., 2002; Morgan & Sideridis, 2006; Samuels, 2006; Therrien,

2004). The current study investigated the impact of combining these two research-based practices into one intervention and then delivering that intervention in two different ways.

Intermediate elementary students with LD may demonstrate an inability to fluently read aloud grade level text (Ferrara, 2005). The participants in the current study were no exception. In fact, criteria for selection as a participant required ORF rates below the Fall 50th percentile for fifth-grade (less than 110 WCPM), according to Hasbrouck and Tindal (2006) established norms. The current study reinforced the use of repeated reading interventions for intermediate students with LD as all four participants demonstrated increases in WCPM rates. Hasbrouck and Tindal (2006) reported that a 25% increase in reading rate can be expected with the use of repeated reading interventions and that expectation was met by all four participants. As illustrated in both Table 3 and Figure 1, Student 1 increased his reading rate by 42% and Student 2 increased his rate by 45%. Student 3 posted a 25% gain and Student 4 increased 32%.

Hasbrouck and Tindal (2006) also report that students in grades 2-8 who are reading ten words less than the 50th percentile for their grade level can be considered at an appropriate range for their grade level at that time of year. Therefore, a 5th grade student at the end of the year is expected to be reading at least 129 WCPM. Students 1 and 2 attained this goal. Students 3 and 4 did not. One possible explanation for the slower progress of Students 3 and 4 could be their individual need to continue receiving interventions in the lower-level word identification and vocabulary skills on a one-on-one basis prior to moving on to ORF practice.

Oral reading fluency measurements are regarded as critically important indicators of how well an individual is reading (Fuchs et al., 2001; National Institute of Child Health and Human Development [NICHHD], 2000). According to Roberts et al. (2008) and Tindal et al. (2005)

adolescent readers who can read aloud between 120 to 170 words correct per minute can be thought of as successful readers, depending upon the difficulty of the text. Using this criterion, two of the participants in the study, Student 1 and Student 2, achieved this level of success. However, other measures of success must also be considered.

At the beginning of the school year Student 1 self-reported that he liked math and science but did not like to read. During the final interview he felt his reading had improved and he felt "pretty good" about meeting his goals. His Lexile reading ability measure increased by 27%, moving him into the "on-grade level" category. One can speculate about the impact the use of science text during the intervention may have had on his motivation to engage in repeated reading exercises.

Student 2, who also met the above criterion for a successful reader, self-reported at the beginning of fifth-grade that he did not enjoy reading and did not know if he is a good reader or not. This lack of self-awareness of personal abilities is a common characteristic of students with LD (NJCLD, 2008) and may have been exacerbated for Student 2 when he was held back this year for a second time in fifth-grade. Student 2 was a very shy, quiet boy who was not easy to engage in casual conversation. For the first half of the school year his behaviors indicated a reluctance to form personal relationships and an overall attitude of defeat. During the initial one-on-one delivery phase (B1) he was quite distressed about having to interact one-on-one with a teacher. Over the course of the study however a different personality began to emerge. Anecdotal evidence recorded in the Daily Log noted that he became more talkative, occasionally smiled, and generally seemed more eager to participate in the interventions. A close examination of the curriculum-based measures shown in Figure 3 may reveal an explanation for this evolution.

Student 2 experienced the same novelty effect as the other participants on the initial two one-on-one sessions. At that point however, his scores plummeted and it was not until the second session in the first videotaped phase (session 14) that his scores truly began to increase. After that, his scores never again reached the lows experienced in the initial phase. Given what is known about this particular learner's characteristics, one can speculate that perhaps the greatest measure of success seen in this study is the fact that interacting with a videotaped recording of a teacher was a preferred form of instruction for this troubled boy. In the final interview he reported that the one-on-one sessions were "harder" for him and he preferred the videotaped sessions. "When I'm reading with someone else I get confused with the words," he said, and "It is easier to concentrate," when reading with the videotape. His perception (although it is not accurate) was that the teacher was reading slower in the videotaped sessions and therefore it was easier to keep up with her. Referring back once again to the data, it appears as if the videotaped interventions allowed Student 2 to experience a feeling of success as a reader, and he built upon that confidence to actually emerge from the study with a 45% increase in his mean WCPM measures. His Lexile scores however did not reflect that same level of improvement, only going up 7% and still qualifying him as below grade level for reading ability.

Student 3 demonstrated the least overall improvement over the course of the current study, though he did match the 25% improvement in ORF which can be expected for students who engage in repeated reading exercises (Samuels, 1979). At the beginning of fifth-grade he self-reported that he did not like to read and did not think he was a good reader. During the final interview he discussed his desire to always do his best after looking at his goal for improvement each day. His preference for videotaped sessions in light of his perception that they were more

difficult for him was interesting, and yet overall he felt like the one-on-one sessions helped him the most because they were easier to keep up with the teacher. His Lexile reading ability measure increased only 1% over the course of the year and a visual inspection of Figure 4 reveals that his WCPM measures were heavily influenced by his relatively high rate of errors.

Overall, the lack of progress experienced by Student 3 lends support to the research demonstrating the effect poor word recognition has on the development of ORF (Jenkins et al., 2003). Faulkner and Levy (1999) found that when conducting repeated reading exercises, the first thing that poor readers learn is word recognition. Based on their study, as well as the research of Roberts et al. (2008), the current study provided some overlap of key vocabulary between easier passages #1 and grade level passages #2 in order to scaffold learning gains achieved through repeated reading practice to the grade level curriculum-based measurement. In the end, Student 3's poor ORF rates may be the most obvious indicator of his continuing struggle with word identification skills (Jenkins et al.).

Student 4 experienced a 32% increase in her mean WCPM rates during the current study, and although her Lexile measures of reading ability only increased 3% she did move into the "On Grade Level" category of reading performance. At the beginning of fifth grade Student 4 self-reported that she liked to read and thinks of herself as a good reader. During the interview at the conclusion of the study she reported that she thinks her reading improved and "I feel great about that!" Student 4 reported that she liked the one-on-one interventions best, but she thought the videotaped helped her improve her ORF more. Anecdotal evidence recorded by the interventionist in the Daily Log indicated that out of the four participants Student 4 seemed the most successful at keeping up with the pace when reading one-on-one, and although the current

study did not measure prosody, Student 4 was by far superior at following the direction to "make it sound just like I make it sound."

One-on-One and Videotaped Modeling by Effective Teachers

The implementation of an RTI framework requires multidisciplinary collaboration within schools to coordinate efforts to plan and deliver interventions for students who are unsuccessful in meeting grade level standards (Hall, 2008; Vaughn & Roberts, 2007). Research clearly demonstrates that the quality of the teacher is one of the most important determinants of student success (Berry, Hoke, & Hirsch, 2004; Blair et al., 2007), and students with LD rely on the use of research-based practices implemented with fidelity in order to positively affect their learning outcomes (Darling-Hammond & Berry, 2006; Lose, 2008; McEneaney, Lose, & Schwartz, 2006). A vital element of the current study was the use of an effective teacher across both methods of intervention, modeling the use of best practices. Therefore the results gleaned from this study corroborated the evidence: It is critical that teaching practices utilized during reading intervention sessions are not only research-based but also model effective implementation of the desired skill all the while addressing the individual learner characteristics (Denton et al., 2003).

The need for further research into using technology to enhance the reading performance of students with disabilities has been discussed, along with the effect of continued use of outdated teaching practices (Edyburn, 2007). The current study supported Edyburn's call for additional research on the use of technology-enhanced reading interventions and results indicated that for some students opportunities to advance their reading skills clearly presented themselves during videotaped interventions viewed by the participants on the screen of a computer.

Evidence of this effect was heard through participants who reported that the experience was "kinda' cool" and "neat" and "easier to concentrate." One student even reported that he noticed "you can raise the volume if you want. With a regular teacher you can't raise the volume." While on the surface this observation may seem rather simplistic, to a student with hearing or auditory processing difficulties this observation makes a valuable connection between research and practice.

Perhaps the most powerful message to be gained from the qualitative data collected in response to Research Question three was the perceived difference it makes to have a teacher interacting one-on-one with a student. While several of the participants mentioned things like being able to ask questions during the one-on-one sessions, or having the teacher slow down and help them during one-on-one sessions, at no time did the interventionist stray from the scripted procedures to answer these types of questions or slow down. In fact, the interventionist had a high fidelity rating of 96.9% (see Appendix R), as the inter-rater observations will attest to, but for some reason students perceived that the teacher was more willing and able to help them when they were reading with her one-on-one. Student 3 reported during the final interview that the one-on-one interventions helped him the most because "if you mess up, the teacher can tell you to read over again, but since it is recorded on the videotape the teacher can't tell you" and "with the videotape she just reads at her regular pace. If it is too hard, she can't do anything about it. But with one-on-one if you are kind of behind she slows down for you." Student 4 also incorrectly reported that during one-on-one sessions if the teacher "is reading really fast I can tell her 'I can't keep up' and she will slow down."

The researcher does not believe that the participants are being dishonest. Statements like; "You can't talk to a computer," and "With one-on-one it is like someone is there; it makes it feel more right. The videotape felt like nobody was there" point to the difference it makes in the mind of a child to have the attention of their teacher. Furthermore, students seem to perceive that the teacher has more confidence in their abilities to be independent after one-on-one interventions. For example, Student 4 stated "She [the teacher] knows I know what to do so she just sends me right to it so I can get done right away."

The conjecture can be made that these students actually perceived these situations to be real because they could happen under similar conditions. In fact the reported misperceptions seem to suggest that the presence of the teacher during the one-on-one sessions gave students the feeling that help was available if they needed it. During the videotaped sessions, they were keenly aware of the fact that human interaction was not possible. The very existence of such misconceptions would appear to support the use of the one-on-one method as a superior way of providing the scaffolding essential for learning (Vygotsky, 1962).

Implications of Findings

Social validity is an evaluation of the social relevance of providing interventions (Kazdin, 1982; Wolf, 1978). Since a literate workforce is a universal American expectation, early prevention of reading difficulties has become an enormous societal concern (Al Otaiba et al., 2005). Therefore, studies conducted with the purpose of broadening our knowledge of instructional practices in the field of reading remediation are socially valid endeavors (Chard et al., 2009; Horner et al., 2005). The current study examined methods for improving instructional

practices in reading in ways that meet the needs of both the struggling learner and the time-constrained teacher who may have many students who struggle with basic literacy skills.

The investigation employed the use of a prerecorded videotaped intervention. A basic assumption of this practice is that a busy teacher can gain some level of flexibility by trading the use of non-instructional time for instructional time. Prerecorded interventions may be used again and again over the years to come, thus providing significant savings in both time and cost.

The interventionist in the current study spent about 32 minutes of instructional time each day engaged with students during the one-on-one interventions. She then spent about 45 minutes of non-instructional time preparing materials. An analysis on the use of fifth-grade general education teachers' time at the school which served as the setting for this study revealed about 263 minutes of available instructional time each day. Therefore, one-on-one repeated reading interventions for four students take about 12% of a teacher's instructional time each day. The average fifth-grade class size at this school was 23 students. At the beginning of the school year a total of 47 fifth-grade students (of whom 15 were previously identified as LD) were found to be in need of either tier two or tier three interventions, which equates to about seven students per teacher. Consequently, if no additional personnel were utilized, the general education teacher would be required to spend 24% of his or her instructional time per day, four days per week, engaged in providing interventions. Fortunately, the fifth-grade team at this particular school can draw upon the support of one specific learning disabilities teacher, one reading specialist, and four instructional assistants to assist in providing interventions during the 35 minute time period set aside for this purpose four days per week.

During the videotaped phases, the interventionist spent essentially no instructional time engaged with students. Therefore, she was free to pursue other instructional activities, perhaps intervening on behalf of other tier two or tier three students with different needs, for about 32 minutes. She then spent about 60 minutes of non-instructional time preparing materials and assessing student progress towards goals for the four participants.

Minutes matter. In particular the amount of school instructional time students spend engaged in reading matters (Blair et al., 2007). Unfortunately, the demands upon all teachers' instructional and non-instructional time have become more intense during this era of increased accountability. Teachers have limited non-instructional time. The teachers employed at the school where this study took place are paid for an average of 112 minutes per day of non-instructional time. During this time all teachers are required to accomplish a seemingly endless list of activities including grading papers, planning lessons, conducting parent-teacher conferences, collaborating with colleagues – a list which goes on and on. At question is the trade-off between instructional and non-instructional time, and how to best use that time to benefit all students.

The results of this study suggest value in devoting time to the preparation of some prerecorded videotaped ORF interventions. Teachers could collaborate to create digital libraries of reading interventions at a wide variety of instructional levels, utilizing both fictional and non-fictional text. Schools could share these interventions across grade levels to be used in general education classrooms, special education resource rooms, computer labs, and even at home with portable media devices or through access to a school website. For some intermediate students

practicing repeated reading with a videotape of a favorite first- or second-grade teacher may prove to be highly motivational.

A final implication of the findings is the validation it provided on the value of the one-on-one relationship between a child and his or her teacher. An anticipated finding was that repeated reading led to boredom and disengagement from learning. Instead, what was discovered were students who obviously appreciated the one-on-one attention and time spent alone with an educator. A basic assumption of this study was that when students viewed the videotaped intervention using a known interventionist they would have a positive reaction to recognizing the individual in the video. From the learner's perspective, the fact that the model was provided by a known, helpful teacher rather than an unknown individual gave purpose to the efforts required to create the videotapes. Many ORF software packages are currently on the market available for purchase, but they feature the face of an unknown individual, or an animated character, or even no face at all. Therefore, for the purposes of conducting this study, the assumption was made that participants will more readily engage in repetitive reading practices, both one-on-one and through videotape, when they can mentally connect to the person delivering the intervention.

Recommendations for Future Research

Individual single-subject studies are one part of a research process that occurs in stages (Odom et al., 2005). The continuum begins by establishing a foundational stage which describes subjects through observations and then progresses through more controlled studies until reaching the randomized clinical trials stage and earning the distinction of being an effective classroom practice (Odom et al.). The study described herein was designed with the intent of providing data

for the foundational stage of an experimental line of research. Quality indicators as proposed by Horner et al. (2005) served as a guide for the design of the research, and a rubric of the quality indicators specifically created for single-subject studies on the impact of repeated reading interventions for students with LD (Chard et al., 2009) was used to assess this design.

In the review of relevant research supporting the current study an investigation by Welsch (2007) was discussed. He conducted a single-subject study on the use of experimental analysis to determine the best ORF intervention for individual students with LD. He used a variation of an alternating-phases design in which he briefly experimented with four different treatments for each participant. The treatment that demonstrated the greatest effect for each student was then administered to that student for an extended period of time, and CBMs were used to monitor individual progress. Results indicated a functional relationship between the use of a brief experimental analysis and improvements in ORF, suggesting that within the construct of LD individual differences in the root cause of disfluency should be addressed (Welsch). The current study supports the procedures utilized by Welsch in that not all four participants responded well to the same treatment. Results for Student 3 in particular reveal the futility of continuing with an intervention that did not match his individual needs. Perhaps a period of brief analysis utilizing not only the chosen methods, but also other research-based methods of improving ORF, would have revealed a better choice of intervention method for Student 3.

One key revelation in the presentation of results for question two can be seen in Figure 6. This graph can be examined closely for overall patterns of variability of WCPM scores. The visual depiction indicates that at the conclusion of the study all four participants experienced decreased variability of WCPM rates. Student 1, who experienced the highest post-study mean

WCPM (148), finished the study with the lowest variance of EPM scores (2). Student 3, who experienced the lowest post-study mean WCPM (90), finished the study with the highest variance of EPM scores (11). In conclusion, perhaps further consideration must be given to the effect of score variance on measures of ORF.

The concept of using best practices in reading research to remediate once and for all our intermediate students identified as LD is probably too simplistic. Other factors to consider include choice of placement, availability of experienced, effective teachers, availability of resources (including technology), and difficulties associated with bringing reading research to scale. In addition, further research is needed to determine if students with LD can sustain over time the fluency increases they gain through this or any method of reading instruction

Limitations

The current study, like all research conducted with human subjects, was subject to several limitations that may well have impacted the final results. First and foremost, the small sample size utilized in this single-subject design could be considered a limitation. Simply put, a different choice of participants could have yielded different results.

Furthermore, a relatively short time period was allowed for demonstration of progress as a result of the intervention. Oral reading fluency remediation is historically known to be a slow, gradual process requiring a great deal of practice time in order to demonstrate a level of effectiveness that will lead to generalization of the skill (Denton et al., 2003). The good news is that we know success in improving ORF can be attained for intermediate students with LD

(Roberts et al., 2008; Thierren, 2004), the bad news is this places a limitation on repeated oral reading research and complicates decisions about the duration of phases. The implementation of this study continued for a time period of 36 data points; long enough to demonstrate results while dealing with the natural constraints of other potential demands upon the participants' daily and weekly school schedule such as holidays, illnesses, and scheduled standardized assessments.

Self-selection of reading materials is a research-based method of increasing reading comprehension of struggling students (Carbo, 2007). However the use of pre-recorded videotaped interventions did not permit the application of self-selection to either phase in this study. Therefore an assumption was made that students will engage repeatedly with text in spite of the lack of choice about the text itself. Likewise, a limitation of the videotaped method is that it forces the procedure of practicing repeated reading of text without immediate error correction when research shows that immediate correction is a superior method (Nelson et al., 2004; Therrien, 2004). Since immediate error correction was not possible during the videotaped phase, it was also not utilized during the one-on-one phase. Presumably the participants would have demonstrated greater improvement in EPM rates, leading to corresponding improvements in WCPM rates, if immediate correction had been possible.

This study relies on the Flesch-Kincaid computerized readability tool in order to determine the level of difficulty of text used for each passage. In turn, the reading ability of each participant is measured by the Scholastic Reading Inventory computerized Lexile measurement tool. Research shows that both formulas have limitations, as do all readability formulas. Both Flesch-Kincaid and Lexile measures do not take into account critical factors such as a student's

motivation to read or whether or not a particular text is even appropriate for a particular student to read (Fry, 2002).

A final limitation is that measurements were not taken on the other key components of an effective reading program; phonemic awareness, phonics, vocabulary, and comprehension (NICHHD, 2000). Also it must be mentioned that a true definition of fluency includes measurements of prosody as well as rate and accuracy (Dowhower, 1991; Rasinski, 2003). Yet for the purposes of this study, no attempt was made to measure prosody. The assumption is that all of the aforementioned measurements are beyond the scope of the study at hand, but could certainly be considered as a recommendation for further research at the conclusion of this study.

Conclusions

The current study investigated the use of evidence-based interventions for improving ORF for intermediate students with LD, and the potential impact of effective teachers modeling best practices through both one-on-one and videotaped interventions. The overall positive results seen in remediating ORF measures of WCPM and EPM add to the foundational research base of single-subject studies that is the hallmark of special education research. While results seem to indicate preference towards the use of a one-on-one method of delivering fluency interventions, knowledge was gained on the potential for the use of a videotaped alternative for some students with LD, and further studies exploring other aspects of this method are encouraged.

The teaching of reading has been compared to rocket science (Moats, 1999). On the surface, this comparison would seem accurate. Reading instruction *is* a complex science. Current knowledge of how to teach reading has been realized through the efforts of thousands of

researchers over the course of decades. Teaching others how to activate the cognitive resources required to read involves understanding the complexities of how the human brain processes information. Adding intensity to this complex interaction is the vast diversity of learners within the human population. While understanding the complexities of different individuals' cognitive processing may sound similar to the depth of knowledge required to design and successfully launch rockets into outer space, consider the question; Is teaching as complex as rocket science? According to McEneaney et al.; "Teaching reading is almost certainly *more* complex. Given the same inputs, rockets will usually respond the same way. Children don't" (2006, p. 125).

APPENDIX A
INSTITUTIONAL REVIEW BOARD LETTER OF APPROVAL

University of
Central
Florida

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901, 407-882-2012 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

From : **UCF Institutional Review Board**
FWA00000351, Exp. 10/8/11, IRB00001138

To : **Beth A. Christner** [redacted]

Date : **February 12, 2009**

IRB Number: **SBE-09-06037**

Study Title: **Videotaped Oral Reading Fluency Lab: An Alternative Approach to One-on-One Interventions for Intermediate Elementary Students with Learning Disabilities**

Dear Researcher:

Your research protocol noted above was approved by **expedited** review by the UCF IRB Chair on 2/12/2009. **The expiration date is 2/11/2010.** Your study was determined to be minimal risk for human subjects and expeditable per federal regulations, 45 CFR 46.110. The categories for which this study qualifies as expeditable research are as follows:

6. Collection of data from voice, video, digital, or image recordings made for research purposes.

7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

The IRB has approved a **consent procedure which requires participants to sign consent forms.** Use of the approved, stamped consent document(s) is required. Only approved investigators (or other approved key study personnel) may solicit consent for research participation. Subjects or their representatives must receive a copy of the consent form(s).

All data, which may include signed consent form documents, must be retained in a locked file cabinet for a minimum of three years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained on a password-protected computer if electronic information is used. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

To continue this research beyond the expiration date, a Continuing Review Form must be submitted 2 – 4 weeks prior to the expiration date. Advise the IRB if you receive a subpoena for the release of this information, or if a breach of confidentiality occurs. Also report any unanticipated problems or serious adverse events (within 5 working days). Do not make changes to the protocol methodology or consent form before obtaining IRB approval. Changes can be submitted for IRB review using the Addendum/Modification Request Form. An Addendum/Modification Request Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at http://iris.research.ucf.edu .

Failure to provide a continuing review report could lead to study suspension, a loss of funding and/or publication possibilities, or reporting of noncompliance to sponsors or funding agencies. The IRB maintains the authority under 45 CFR 46.110(e) to observe or have a third party observe the consent process and the research.

On behalf of Tracy Dietz, Ph.D., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 02/12/2009 01:47:01 PM EST

Joanne Muratori

IRB Coordinator

APPENDIX B
SCHOOL DISTRICT LETTER OF APPROVAL

January 5, 2009

Mrs. Beth A. Christner
[redacted]

Dear Mrs. Christner:

I am in receipt of the proposal and supplemental information that you submitted for permission to conduct research in the [redacted] Public Schools. After review of these documents, it has been determined that you are granted permission to conduct the study described in these documents under the conditions described herein.

The principal, [redacted], has agreed to participate in your study. You are expected to make appointments in advance to accommodate the administration and/or staff for research time. Furthermore, any processing or comparison of data will be your responsibility and shall not impact our Testing Department.

Please forward a summary of your project to my office upon completion.
Good Luck!

Sincerely,

[redacted]
Executive Director
Secondary Education

[redacted]

APPENDIX C
PARENTAL LETTER OF CONSENT

Dear Parent / Guardian;

Researchers at the University of Central Florida (UCF) study many topics. To do this we need the help of people who agree to take part in a research study. You are being asked to allow your child to take part in a research study which will include about four students. Your child is being invited to take part in this research study because he or she is a special education student at ____ Elementary School and has been identified as having a reading learning disability.

You can ask questions about the research. You can read this form and agree right now for your child to take part, or take the form home with you to study before you decide. You must be an adult 18 years of age or older or an emancipated minor according to the laws of the State of Florida to be able to give this permission and sign this form for your child to take part in this research study.

The person doing this research is Mrs. Beth Christner of UCF's College of Education. Because the researcher is a graduate student, she is being guided by Dr. Jennifer Platt, a UCF faculty supervisor in the Department of Child, Family, and Community Sciences.

Study title: Video Taped Oral Reading Fluency Lab: An Alternative Approach to One-on-One Interventions for Intermediate Elementary Students with Learning Disabilities

Purpose of the research study: The purpose of this study is to determine if a pre-recorded videotape of a teacher (Mrs. Christner) practicing repeated reading helps improve oral reading fluency at the same rate as practicing with the same teacher one-on-one in person for individual 5th-grade students with learning disabilities.

What your child will be asked to do in the study: Your child will participate in repeated reading exercises, a practice which has shown through research to help improve oral reading fluency measurements for students with learning disabilities. The study will last about 12 weeks, and will begin in February 2009.

In the beginning, the repeated reading exercises will be presented in person by the teacher, Mrs. Christner. At each practice session your child will sit across from the teacher, reading aloud along with the teacher. At the end of each practice session your child will record his or her own voice reading aloud two separate passages for one minute each. Your child will only be audio taped, never video taped.

After about three weeks, the repeated reading exercises will stop using the one-on-one sessions with Mrs. Christner and instead use a pre-recorded video tape of Mrs. Christner using the same

practice methods. At each of these sessions your child will sit in front of a computer wearing headphones in order to listen to the video tape and read aloud along with the recording of the teacher. Again, at the end of each practice session your child will record his or her own voice reading aloud two passages for one minute each.

At the end of every practice session, your child will be asked to fill out a short form telling how they felt about the session that day. Questions like "How do you feel today?" and "Is the teacher reading too fast or too slow?" will be asked on the form.

After your child has returned to their regular classroom, Mrs. Christner will listen to the audio tapes and score each for oral reading fluency measurements of rate and accuracy. These measurements will be graphed, and progress will be shared with your child at the beginning of the next practice session. The audio recordings of your child will be given a code number and securely stored until the end of the study when they will be erased.

When about three weeks of video taped practice is done, the study will go back to using the one-on-one practice sessions for about three weeks, and then end with about three weeks of the video taped sessions.

At the end of the study, your child will be briefly interviewed in order to find out how he or she felt about the two different kinds of practice sessions; video taped and one-on-one. This interview will be audio taped, written down, given a code number instead of your child's name and then the recording will be erased.

Mrs. Christner is also asking for your permission to look at past and future information including: Scores on your child's Florida Comprehensive Assessment Test (FCAT), your child's Individual Education Program (IEP) document, Lexile reading ability scores, and Harcourt and Dynamic Indicators of Basic Early Literacy Skills (DIBELS) oral reading fluency measurements. This information will help her determine academic progress for your child.

Voluntary participation: You should allow your child to take part in this study only because you want to. There is no compensation, payment or extra credit for your child's part in this study. There is no penalty for you or your child for not taking part, and neither one of you will lose any benefits. If you choose to not have your child participate it will not affect your child's grades and it will not affect his or her learning environment at all. Your child will continue to receive the same level of reading support from Mrs. Christner as he or she did before the study began, and Mrs. Christner assures you that it will not in any way affect her feelings towards helping your child be a successful student.

You have the right to stop your child from taking part at any time. All you have to do if you want to stop is write a note to Mrs. Christner or call Mrs. Christner [XXX-XXX-XXXX] and tell her that you want your child to stop. If you would prefer, you could instead write or call _____, our school principal [XXX-XXX-XXXX] and tell her that you want your child to stop. If we receive notice that you are no longer interested in having your child take part, Mrs. Christner will contact you to verify the information, and then she will simply stop using the methods described in this letter, and instead use other teaching methods to help your child be a

successful student. You will be told if any new information is learned which may affect how you feel about letting your child continue to take part in this study.

Location: A resource classroom at _____ Elementary School

Time required: About 20 minutes per day, three or four times per week during the previously scheduled intervention time period of the day. Your child already receives services from Mrs. Christner at this time, so this does not represent a change in his or her daily schedule.

Audio or video taping: Your child will be audio taped during this study, a practice which is common for students who are practicing oral reading fluency. If you do not want your child to be audio taped, he or she may not be able to be in the study, so please discuss this with Mrs. Christner or [the principal]. When your child is audio taped, the recordings will be kept in a locked, safe place until what your child says has been written down and given a code for identification. At the end of the study, the recordings will be erased. Your child will not be video taped during this study.

Risks: There are minimal expected risks for taking part in this study. Your child does not have to answer every question or complete every task. Your child also does not have to answer any questions that make him or her feel uncomfortable. If your child does not want to answer a question or complete a task it is OK for him or her to just tell Mrs. Christner that he or she does not want to and Mrs. Christner will simply proceed to the next task at hand. If at any time your child tells you that he or she does not feel comfortable with any part of the study, please do not hesitate to call Mrs. Christner and discuss your concerns.

Confidentiality: Your child's identity will be kept confidential. Mrs. Christner will make every effort to prevent anyone who is not directly involved in the research from knowing that your child gave us information, or what that information is. For example, your child's name will be kept separate from the information he or she gives, and these two things will be stored in different places.

Your child's information will be assigned a code number (e.g., Student1, Student 2). The list connecting your child's name to this number will be kept in a locked cabinet in a university office, separate from all other study documents and accessible only to Mrs. Christner and her faculty supervisor, Dr. Jennifer Platt. The list will be destroyed within five years after the study is complete.

All audio recordings will be stored on a USB jump drive, protected by a password, and stored in a locked cabinet in Mrs. Christner's classroom. All electronic student data will be stored on a second USB jump drive which is also protected by a password and kept along with all hard copies of study documents in a second locked cabinet, also in Mrs. Christner's classroom. Both locked cabinets can be opened only by Mrs. Christner. All electronic data, as well as all hard copies of documents, will be destroyed within five years after the end of the study.

Your child's information will be described along with information from other children who took part in this study. When Mrs. Christner writes about this study to share what was learned with other researchers, she will write about this information. Your child's name will **not** be used in any report, so people will **not** know how he or she answered or what he or she did.

There may be times when Mrs. Christner may have to show your child's information to other people. For example, Mrs. Christner may have to show your child's identity to people who check to be sure the research was done correctly. These may be people from the University of Central Florida or state, federal or local agencies.

Benefits: Research shows that repeated reading exercises may lead to increased oral reading fluency measurements of rate and accuracy. The benefit to your child of participating in this study is a potential improvement in oral reading fluency. Research also shows that improved oral reading fluency can lead to better reading comprehension. So an additional benefit to your child may be an increase in reading comprehension. The results of this study may someday help educators develop instructional practices to help students improve their oral reading fluency.

Study contact for questions about the study or to report a problem: Mrs. Beth Christner, Graduate Student, Exceptional Education Program, College of Education, [XXX-XXX-XXXX] or by email at _____ or Dr. Jennifer Platt, Faculty Supervisor, Department of Child, Family, and Community Sciences at [XXX-XXX-XXXX] or by email at _____.

IRB contact about you and your child's rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at [XXX-XXX-XXXX].

How to return this consent form to the researcher: Please sign and return this consent form in the enclosed envelope. A second copy is provided for your records.

Please go on to next page for required signatures:

☐ I have read the procedure described above

☐ I voluntarily agree for my child to take part in the research

☐ I am at least 18 years of age

☐ I am an emancipated minor per Florida state law

☐ I AGREE to have my child audio taped

☐ I DO NOT agree to have my child audio taped

_____ _____ _____

Signature of parent Printed name of parent Date

_____

Printed name of child

_____ _____

Principal Investigator Date

APPENDIX D
STUDENT LETTER OF ASSENT

My name is Mrs. Christner. I am doing a research project on oral reading fluency. I am interested in whether you like to practice reading out loud with me one-on-one, or with a videotape recording of me that you will watch on a computer. I want to know if one way is better than another for improving your oral reading fluency. This research is part of my studies at the University of Central Florida.

As a way to study this, I would like to practice reading out loud with you both ways and have you make audio recordings of yourself reading out loud. At the end of the project, you will be asked questions about what you learned, what you thought about the project, and what you would change if you had the chance.

Only Dr. Platt, my professor at UCF, and I will listen to the tape recordings and know it is your voice we hear. You will be given the chance to listen to the first and last tape recording of yourself when the project is over. I will erase the tapes at the end of the project. No names will ever be used so that nobody will know it was you in my project.

Your parent/guardian has given their permission for you to be a part of this project, but you do not have to do be a part of this project. It is your choice. This will not affect your grade if you decide you don't want to do this. You will not be paid for doing this and you will not get extra credit for doing this. You can stop at any time by just telling me you want to stop. Just say “I want to stop.” You also do not have to answer a question if you do not want to. All you have to do is tell me when you don’t want to answer a question and I will not get mad at you. Just say “I don’t want to answer that question.” If you do not want to take part in this study, I will give you another activity to do, and you will still be with me for intervention time.

If you decide you want to be a part of my project and then change your mind later, that is OK. Again, I will not get mad at you. If you change your mind you just need to either tell me, or tell your parent or guardian, or tell another teacher so that they can tell me you changed your mind. If that happens I’ll just give you something else to do.

Would you like to take part in this research project?

_____ I want to take part in Mrs. Christner’s research project.

_____ _____

Student's Signature Date

_____

Student's Printed Name

APPENDIX E
EASIER LEVEL PASSAGE #1

Passage #1

Mixtures

Do you like granola? Granola is a mixture. A mixture is two or more substances that do not change when you put them together. You can also take apart a mixture. So, if you do not like raisins in granola, you can take them out. Mixtures may have more of one part than another. Granola may have more raisins than nuts.

Solids, liquids, and gases can all be parts of mixtures. Air is a mixture of gases. Salad dressing is a mixture of liquids. Granola is a mixture of solids.

Solutions

A solution is a kind of mixture. In a solution, different kinds of matter are mixed together completely. When water and salt are mixed together you cannot see the salt. But you can taste it. Salt water is a solution. Iced tea and sugar can be mixed to make sweet tea. Sweet tea is a solution.

Granola is not a solution. You can tell the difference between the nuts, fruits, and oatmeal. Granola is an example of a mixture.

Adapted from Harcourt Science BLR *Matter and Its Properties,* 5th grade, p. 18-20 *(*R4.2) (wc 171)

APPENDIX F
GRADE LEVEL PASSAGE #2

Passage #2

Mixtures

You put different foods together when you prepare a meal. These foods form a mixture. For example, if you put raisins in your breakfast cereal, you are making a mixture. A snack of mixed nuts is a mixture of different kinds of nuts. A mixture is two or more substances that are combined without changing any of them.

Not all mixtures are made of only solids. For example, iced tea with sugar is a mixture of a liquid and a solid.

Mixtures can be taken apart in many different ways. One way to take apart mixtures is by heating them. When you heat salt water, the water boils and becomes a gas, leaving the salt behind.

Solutions

One kind of mixture is a solution. A solution is made when different kinds of matter are completely mixed with one another. Salt water is an example of a solution. Air is another kind of a solution. Air is a mixture of many different gases.

Adapted from Harcourt Science OLR *Properties of Matter,* 5th grade, p.10-12 *(*R5.5) (wc 163)

APPENDIX G
SCORING REPORT FOR PASSAGE #1

Scoring Report: Session #5, Passage #1

Mixtures

Do you like granola? Granola is a mixture. A mixture is two or more substances that do not change when you put them together. You can also take apart a mixture. So, if you do not like raisins in granola, you can take them out. Mixtures may have more of one part than another. Granola may have more raisins than nuts. [62]

Solids, liquids, and gases can all be parts of mixtures. Air is a mixture of gases. Salad dressing is a mixture of liquids. Granola is a mixture of solids. [91]

Solutions

A solution is a kind of mixture. In a solution, different kinds of matter are mixed together completely. When water and salt are mixed together you cannot see the salt. But you can taste it. Salt water is a solution. Iced tea and sugar can be mixed to make sweet tea. Sweet tea is a solution. [148]

Granola is not a solution. You can tell the difference between the nuts, fruits, and oatmeal. Granola is an example of a mixture. [171]

****

Participant: WCPM:

Scorer: EPM:

Date:

Adapted from Harcourt Science BLR *Matter and Its Properties,* 5th grade, p. 18-20 *(*R4.2) (wc 171)

APPENDIX H
SCORING REPORT FOR PASSAGE #2

Scoring Report: Session #5, Passage #2

Mixtures

You put different foods together when you prepare a meal. These foods form a mixture. For example, if you put raisins in your breakfast cereal, you are making a mixture. A snack of mixed nuts is a mixture of different kinds of nuts. A mixture is two or more substances that are combined without changing any of them. [59]

Not all mixtures are made of only solids. For example, iced tea with sugar is a mixture of a liquid and a solid. [88]

Mixtures can be taken apart in many different ways. One way to take apart mixtures is by heating them. When you heat salt water, the water boils and becomes a gas, leaving the salt behind. [117]

Solutions

One kind of mixture is a solution. A solution is made when different kinds of matter are completely mixed with one another. Salt water is an example of a solution. Air is another kind of a solution. Air is a mixture of many different gases. [163]

****

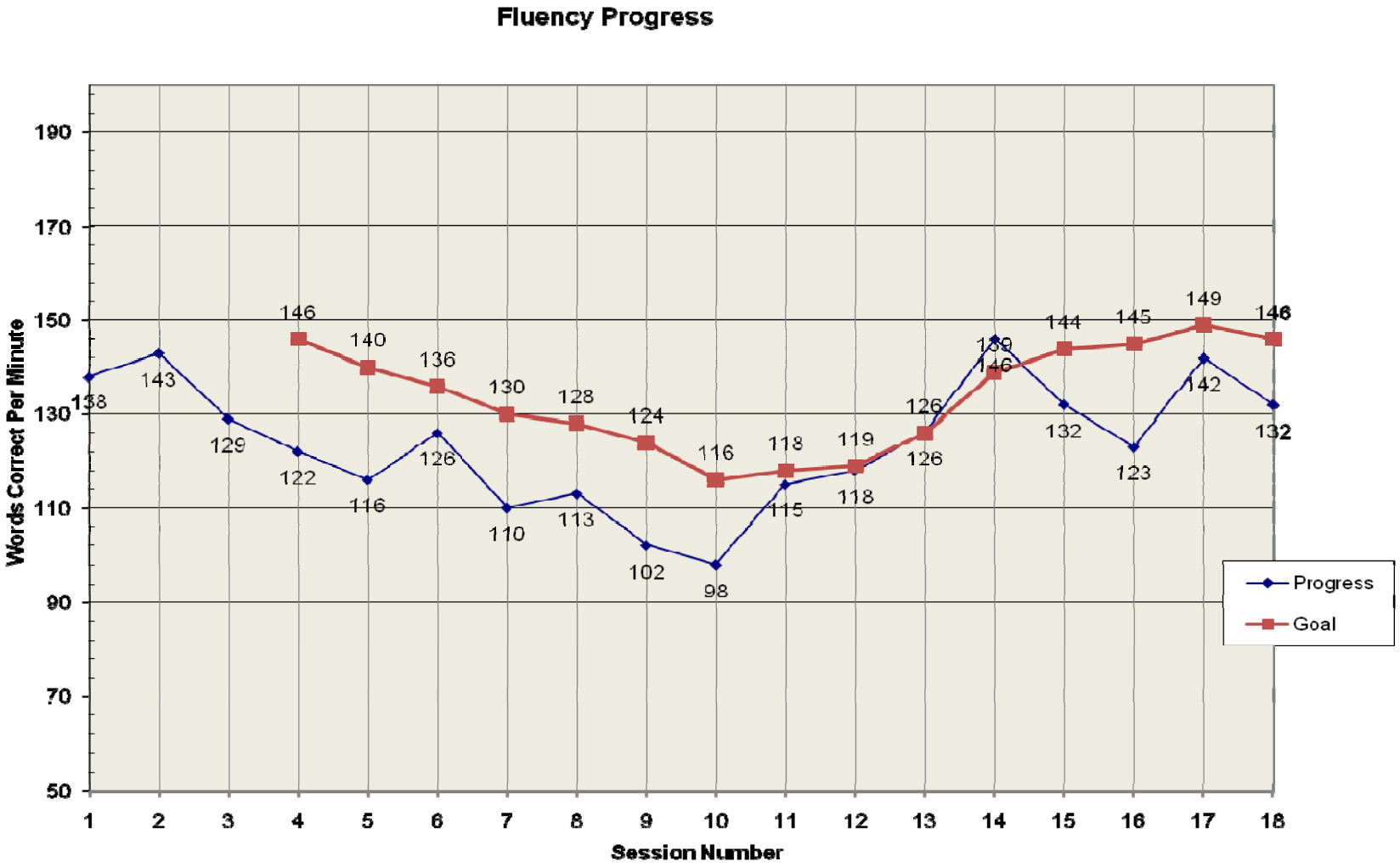
Participant: WCPM:

Scorer: EPM:

Date:

Adapted from Harcourt Science OLR *Properties of Matter,* 5th grade, p.10-12 (R5.5) (wc 163)

APPENDIX I
FLUENCY PROGRESS GRAPH


Fluency Progress
Words Correct Per Minute
190
170
150
130
110
90
70
50
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
Session Number
138
143
129
122
116
126
110
113
102
98
115
118
126
139
132
123
142
132
146
140
136
130
128
124
116
118
119
126
144
145
149
146
Progress
Goal

APPENDIX J
DAILY REPORT

Daily Report

Date: _____

Directions: Please circle the word which best answers the following questions.

1. How do you feel today?

   Excellent **OK** **Not sure** **Not so great** **Terrible**

2. Did you have any problems with the headphones or the computer today? **Yes** **No**

If yes, please tell me about it: _____

_____

3. Passage #1 was….. **too hard** **too easy** **just right**

4. Passage #2 was….. **too hard** **too easy** **just right**

5. The reader is reading… **too fast** **too slow** **just right**

6. Do you have any questions or comments? If you do please write them here:_____

_____

_____

My overall impression of today's session is:


Excellent!


OK


Not sure


Not so great


Terrible!

APPENDIX K
DAILY LOG

Daily Log

Participant	Date	Checklist Completed? (yes or no)	Videotaped (V) or one-on-one (1/1)	Comments
Student 1				
Student 2				
Student 3				
Student 4				
Student 1				
Student 2				
Student 3				
Student 4				
Student 1				
Student 2				
Student 3				
Student 4				

APPENDIX L
STUDENT PROCEDURAL CHECKLISTS
FOR ONE-ON-ONE AND VIDEOTAPED SESSIONS

Student Procedural Checklist – One-on-One Session

Participant: _____ Observer: _____

Date: _____ Beginning Observation Time: _____ Ending Observation Time: _____

Participant Action	Observed (yes or no)	Expected Timeline	Comments / Concerns
1. Enters room and sits down promptly.		1 minute	
2. Turns to Fluency Progress graph and listens to review of progress & goal setting step.		2 minutes	
3. Turns to Passage #1 and listens and follows along.		2 minutes	
4. Reads Passage #1 out loud 2x speaking clearly when reading aloud (no mumbling).		3 minutes	
5. Records Passages #1 and #2 and saves both.		8 minutes	
6. Fills out Daily Report.		2 minutes	
7. Returns notebook.		1 minute	

Directions: After each item below please rate the participant with "yes" or "no". Please add any additional comments on back.

The participant appeared confident about following procedures. yes no

The participant appeared to be in good overall health. yes no

The participant demonstrated good overall behaviors. yes no

Student Procedural Checklist – Videotaped Session

Participant: _____ Observer: _____

Date: _____ Beginning Observation Time: _____ Ending Observation Time: _____

Participant Action	Observed (yes or no)	Expected Timeline	Comments / Concerns
1. Sits down at computer, puts on headphones, and clicks on video to begin play		1 minute	
2. Turns to Fluency Progress graph and listens to review of progress and goal		1 minutes	
3. Turns to Passage #1 and listens and follows along.		2 minutes	
4. Reads Passage #1 out loud 2x, speaking clearly when reading aloud (no mumbling).		3 minutes	
5. Records Passages #1 & #2 -saves both.		5 minutes	
6. Fills out Daily Report.		2 minutes	
7. Returns notebook to interventionist.		1 minute	

Directions: After each item below please rate the participant with "yes" or "no". Please add any additional comments on back.

The participant appeared confident about following procedures yes no

The participant appeared to be in good overall health yes no

The participant demonstrated good overall behaviors yes no

APPENDIX M
INTERVENTIONIST PROCEDURAL CHECKLISTS FOR ONE-ON-ONE AND VIDEOTAPED SESSIONS

Interventionist Procedural Checklist – One-on-One Session

Observer: _____ **Date:** _____

Interventionist Action	Observed (Yes or No)	Expected Timeline	Comments / Concerns
1. All required materials are prepared prior to student arrival.		N/A	
Follows script (copy attached) in areas below:			
2. Directs participants to review Fluency Progress graphs.		2 minutes	
3. Reads aloud Passage #1 three times with proper pace, accuracy, and clarity.		5 minutes	
4. Directs participants to self-record Passage #1 and Passage #2.		1 minute	
During Self-recording and Daily Report steps:			
5. Does not intervene except to answer brief questions or encourage positive behaviors. For example; "Keep going." (May begin one-on-one session with another student once the self-recording step for this student begins.)		11 minutes	

Interventionist Procedural Checklist – Videotaped Session

Observer: _____ **Date:** _____

Interventionist Action	Observed (Yes or No)	Expected Timeline	Comments / Concerns
1. All required materials are prepared prior to student arrival.		N/A	
2. Observes participants while they interact with video. Does not intervene except to answer brief questions or encourage positive behaviors. For example; "Keep going."		10 minutes total	
Videotaped interventionist follows script (copy attached) in areas below:			
3. Directs participants to review Fluency Progress graphs.		1 minute	
4. Reads aloud Passage #1 three times with proper pace, accuracy, and clarity.		5 minutes	
5. Directs participants to self-record Passage #1 and Passage #2.		1 minute	
During Self-recording and Daily Report steps:			
6. Does not intervene except to answer brief questions or encourage positive behaviors. For example; "Keep going."		10 minutes total	

APPENDIX N
INTERVENTION SCRIPT

Intervention Script

In both the videotaped and the one-on-one sessions the interventionist will say:

Turn to your Fluency Progress graph to see the results from your last session. Take a moment to look at the line on your graph.

Also, look at what your goal is for this session. Remember to keep trying to meet or beat that goal!

Now turn to Passage #1 and listen while I read it aloud the first time. Keep your eyes on the words as you are listening. This is your chance to hear how to pronounce each word. It is OK to use your finger to follow along if you want to. Pay close attention to how I make the passage sound. Ready? Begin listening.

The interventionist reads aloud Passage #1 while the participant just listens.

Next, read the passage out loud along with me. As you are reading, keep your eyes on the words and try hard to match my pace. Remember, your goal is to make it sound just like I make it sound. Ready? Let's begin.

The participant and interventionist will both read aloud the instructional text Passage #1. During the one-on-one phase, if the participant falters the interventionist will not intervene or adjust her pace (just like the videotaped phase). When the participant's first oral reading of Passage #1 is completed, the script will continue as follows:

Let's try that again for practice. Remember your goal! Ready? Begin.

The interventionist and participant will read aloud the same passage again. In both the videotaped and the one-on-one sessions the interventionist will say:

OK! Now go to the computer and record both Passage #1 and Passage #2. When you are done fill out your Daily Report and return your notebook to me.

If you forget what to do just follow the steps on your Student Directions sheet. Thanks for reading with me!

APPENDIX O
STUDENT DIRECTION SHEET

Directions

1. Put on your **headphones**.

2. **Record** yourself reading Passage #1. **Follow these steps**:
    - Double-click on the Sound Recorder
    - Click on the red dot to start recording
    - Read aloud Passage #1
    - Click on the blue square to stop recording
    - Next to “File Name” type ***your first name*1**
    - Click on Save

3. **Record** Passage #2. **Follow these steps:**
    - Click on the red dot to start recording
    - Read aloud Passage #2
    - Click on the blue square to stop recording
    - Next to “File Name” type ***your first name* 2**
    - Click on Save

4. Fill out your **Daily Report** and put your notebook on my desk.

APPENDIX P
PARTICIPANT INTERVIEW SCRIPT

This interview will be conducted by an independent observer at the conclusion of the study. Interviews will be conducted one-on-one and each interview will be audio-recorded, transcribed, and the tape recordings will be destroyed. Code numbers, rather than actual names of participants, will be used in the transcribed text.

My name is _____ and today's date is _____. I am going to ask you a few questions about your experience with Mrs. Christner's fluency project.

1. *Please tell me your name and how old you are today.*

2. *Would you like to listen to a recording of yourself from one of your first recorded sessions in the project and a recording from one of your last sessions?*

   If the participant's response is yes: Take a few minutes to play both recordings. Make note of any comments made by the participant while listening to the recordings.

   If the participant's response is no: *Why don't you want to listen to a recording of yourself?*

3. *Think about how you sound now when you read out loud compared to how you sounded when you first started this project. Do you think you improved your oral reading fluency during the time you practiced with Mrs. Christner?*

   If the participant's response is yes: *In what ways do you feel you improved?*

   If the participant's response is no: *Why don't you feel you improved?*

4. *Think about your Fluency Progress graph: How did you feel about looking at it each time before you started reading?*

5. *Imagine for a minute that you did not get to look at the Fluency Progress graph each time and instead Mrs. Christner just told you whether or not you improved during the previous session. Do you think you would have improved your reading rates as much as you did?*

6. *Think about the goal you had each day: Do you think having a goal helped you improve your oral reading fluency rates? Why or why not?*

7. *Think about the passages you read each time: Talk to me about the passages. Were they too hard or too easy? What kinds of things did you notice about them?*

You participated in two types of fluency practice: A videotaped version where you practiced by yourself on the computer and a one-on-one version where you practiced with your teacher. The rest of my questions are because I really want to know how you feel about both types of fluency practice.

8. *Which type of practice did you like best, videotaped or one-on-one? Why?*

9. *Which type did you think was the hardest to do, videotaped or one-on-one? Why do you think that?*

10. *Which type do you think helped you improve your oral reading fluency the most, videotaped or one-on-one? Why do you think that?*

11. *Think about how much time you spent practicing fluency each day: Which do you think took longer to do each day, videotaped or one-on-one? Why?*

12. *Think about how fast or slow Mrs. Christner was reading: Was it easier to keep up with her during one-on-one sessions or during videotaped sessions? Why do you think it was like that?*

13. *Think about the written Student Directions: Was it hard for you to follow the directions during the one-on-one sessions? Why or why not?*

14. Was it hard for you to follow the directions during the videotaped sessions? Why or why not?

15. Was there anything that bothered you about either the videotaped or one-on-one sessions?

16. Was there anything that you particularly liked about either the videotaped or one-on-one sessions?

Thank you so much for answering all my questions. Your answers will help us know how to make practicing fluency even better in the future. Do you have anything else you would like to say about your experience with this project?

Thank you again for all your help.

APPENDIX Q
STUDENT DATA COLLECTION TABLES

Student 1 Data Collection

Session #	Phase	WCPM	Phase Mean WCPM	Phase Range WCPM	EPM	Phase Mean EPM	Phase Range EPM
1	Baseline	105			4		
2	Baseline	108			3		
3	Baseline	99	104	9	5	4	2
4	One-on-one	149			4		
5	One-on-one	116			0		
6	One-on-one	117			2		
7	One-on-one	113			1		
8	One-on-one	140			0		
9	One-on-one	148			1		
10	One-on-one	125			3		
11	One-on-one	156			2		
12	One-on-one	115	131	43	8	2.3	8
13	Videotaped	115			4		
14	Videotaped	119			7		
15	Videotaped	121			2		
16	Videotaped	126			2		
17	Videotaped	109			2		
18	Videotaped	130			0		
19	Videotaped	126			5		
20	Videotaped	129			3		
21	Videotaped	121	122	21	0	2.7	7
22	One-on-one	139			6		
23	One-on-one	117			3		
24	One-on-one	129			0		
25	One-on-one	110			4		
26	One-on-one	161			2		
27	One-on-one	145			2		
28	One-on-one	141			1		
29	One-on-one	133			3		
30	One-on-one	130	134	51	0	2.3	6
31	Videotaped	162			1		
32	Videotaped	absent			absent		
33	Videotaped	146			2		
34	Videotaped	157			2		
35	Videotaped	151			0		
36	Videotaped	138			1		
37	Videotaped	138			2		
38	Videotaped	159			0		
39	Videotaped	147	150	24	2	1.3	2
Mean Total			134			2.2	

Student 2 Data Collection

Session #	Phase	WCPM	Phase Mean WCPM	Phase Range WCPM	EPM	Phase Mean EPM	Phase Range EPM
1	Baseline	92			8		
2	Baseline	101			5		
3	Baseline	101	98	3	6	6.7	3
4	One-on-one	138			6		
5	One-on-one	143			5		
6	One-on-one	129			7		
7	One-on-one	122			1		
8	One-on-one	116			2		
9	One-on-one	126			3		
10	One-on-one	110			8		
11	One-on-one	113			5		
12	One-on-one	102	122	41	1	4.2	7
13	Videotaped	98			8		
14	Videotaped	115			7		
15	Videotaped	118			2		
16	Videotaped	126			8		
17	Videotaped	146			8		
18	Videotaped	132			6		
19	Videotaped	123			2		
20	Videotaped	142			10		
21	Videotaped	132	126	48	5	6.2	8
22	One-on-one	138			7		
23	One-on-one	121			3		
24	One-on-one	143			4		
25	One-on-one	128			9		
26	One-on-one	148			7		
27	One-on-one	147			3		
28	One-on-one	133			4		
29	One-on-one	Absent			Absent		
30	One-on-one	134	137	26	3	5	6
31	Videotaped	158			3		
32	Videotaped	141			3		
33	Videotaped	146			3		
34	Videotaped	141			3		
35	Videotaped	144			5		
36	Videotaped	156			7		
37	Videotaped	137			2		
38	Videotaped	137			0		
39	Videotaped	153	145	21	2	3.1	7
Mean tot			133			4.6	

Student 3 Data Collection

Session #	Phase	WCPM	Phase Mean WCPM	Phase Range WCPM	EPM	Phase Mean EPM	Phase Range EPM
1	Baseline	84			6		
2	Baseline	74			10		
3	Baseline	59	72	25	8	8	4
4	One-on-one	104			5		
5	One-on-one	97			7		
6	One-on-one	74			6		
7	One-on-one	113			4		
8	One-on-one	87			5		
9	One-on-one	97			4		
10	One-on-one	93			11		
11	One-on-one	90			4		
12	One-on-one	85	93	39	10	6.2	7
13	Videotaped	67			8		
14	Videotaped	75			7		
15	Videotaped	86			5		
16	Videotaped	87			6		
17	Videotaped	84			10		
18	Videotaped	78			8		
19	Videotaped	97			16		
20	Videotaped	91			5		
21	Videotaped	81	83	30	8	8.1	11
22	One-on-one	91			7		
23	One-on-one	94			4		
24	One-on-one	107			5		
25	One-on-one	105			17		
26	One-on-one	100			10		
27	One-on-one	84			8		
28	One-on-one	80			1		
29	One-on-one	94			6		
30	One-on-one	84	93	27	12	7.8	16
31	Videotaped	102			13		
32	Videotaped	83			5		
33	Videotaped	102			6		
34	Videotaped	77			5		
35	Videotaped	87			10		
36	Videotaped	88			5		
37	Videotaped	82			6		
38	Videotaped	96			2		
39	Videotaped	91	90	25	5	6.3	11
Mean tot			90			7.1	

Student 4 Data Collection

Session #	Phase	WCPM	Phase Mean WCPM	Phase Range WCPM	EPM	Phase Mean EPM	Phase Range EPM
1	Baseline	87			5		
2	Baseline	86			4		
3	Baseline	88	87	2	3	4	2
4	One-on-one	131			1		
5	One-on-one	113			1		
6	One-on-one	92			1		
7	One-on-one	140			1		
8	One-on-one	135			0		
9	One-on-one	124			2		
10	One-on-one	91			1		
11	One-on-one	102			0		
12	One-on-one	97	114	49	5	1.3	5
13	Videotaped	113			5		
14	Videotaped	116			8		
15	Videotaped	104			1		
16	Videotaped	119			2		
17	Videotaped	123			1		
18	Videotaped	121			1		
19	Videotaped	116			2		
20	Videotaped	95			3		
21	Videotaped	116	114	28	7	3.3	7
22	One-on-one	95			1		
23	One-on-one	98			0		
24	One-on-one	122			2		
25	One-on-one	98			0		
26	One-on-one	117			1		
27	One-on-one	91			0		
28	One-on-one	108			0		
29	One-on-one	109			2		
30	One-on-one	90	103	32	2	0.8	2
31	Videotaped	126			1		
32	Videotaped	103			6		
33	Videotaped	111			3		
34	Videotaped	133			4		
35	Videotaped	108			2		
36	Videotaped	113			0		
37	Videotaped	120			3		
38	Videotaped	118			2		
39	Videotaped	106	115	30	4	2.8	6
Mean Tot			112			2.1	

APPENDIX R
FIDELITY OF IMPLEMENTATION DATA

Fidelity of Implementation / Student 1

Session Number	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
One-on-One Phase B1							
4 (Practice)	1	1	1	1	1	1	1
5 (Practice)	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
12	1	1	0	1	1	1	1
Videotaped Phase C1							
13	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1
One-on-One Phase B2							
23	1	1	1	1	1	1	1
29	1	1	0	1	1	1	1
30	1	1	1	1	1	1	1
Videotaped Phase C2							
32	1	1	1	1	1	1	1
35	1	1	1	1	1	1	1
39	1	1	1	1	1	1	1
Total Observed	12/12	12/12	10/12	12/12	12/12	12/12	12/12
Total Fidelity Rating	82/84	97.6%					

Key: 1 = Observed / 0 = Not Observed

Fidelity of Implementation / Student 2

Session Number	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
One-on-One Phase B1							
1 (Practice)	1	1	1	1	1	1	1
2 (Practice)	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
Videotaped Phase C1							
10	1	1	1	1	1	1	1
13	1	0	1	1	1	1	1
16	1	1	1	1	1	1	1
One-on-One Phase B2							
20	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1
27	1	1	1	1	1	1	1
Videotaped Phase C2							
29	1	1	1	1	1	1	1
32	1	1	1	1	1	1	1
36	1	1	1	1	1	1	1
Total Observed	12/12	11/12	12/12	12/12	12/12	12/12	12/12
Total Fidelity Rating	83/84	98.8%					

Key: 1 = Observed / 0 = Not Observed

Fidelity of Implementation / Student 3

Session Number	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
One-on-One Phase B1							
1 (Practice)	1	1	1	1	1	1	1
2 (Practice)	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
Videotaped Phase C1							
10	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1
One-on-One Phase B2							
20	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1
27	1	1	1	1	1	1	1
Videotaped Phase C2							
29	1	1	1	1	1	1	1
32	1	1	1	1	1	1	1
36	1	1	1	1	1	1	1
Total Observed	12/12	12/12	12/12	12/12	12/12	12/12	12/12
Total Fidelity Rating	84/84	100%					

Key: 1 = Observed / 0 = Not Observed

Fidelity of Implementation / Student 4

Session Number	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
One-on-One Phase B1							
1 (Practice)	1	1	1	1	1	1	1
2 (Practice)	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
Videotaped Phase C1							
10	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1
One-on-One Phase B2							
20	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1
27	1	1	1	1	1	1	1
Videotaped Phase C2							
29	1	1	1	1	1	1	1
32	1	1	1	1	1	1	1
36	1	1	1	1	1	1	1
Total Observed	12/12	12/12	12/12	12/12	12/12	12/12	12/12
Total Fidelity Rating	84/84	100%					

Key: 1 = Observed / 0 = Not Observed

Fidelity of Implementation / Interventionist

Session Number	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6
One-on-One Phase B1						
1 (Practice)	1	1	1	1	1	N/A
2 (Practice)	1	1	1	1	1	N/A
4	1	1	1	1	1	N/A
7	1	1	1	1	1	N/A
9	1	1	1	1	1	N/A
Videotaped Phase C1						
10	1	1	1	1	1	1
13	1	1	1	1	0	1
16	1	1	1	1	1	1
One-on-One Phase B2						
20	1	1	1	1	1	N/A
26	1	1	1	1	1	N/A
27	1	1	1	1	0	N/A
Videotaped Phase C2						
29	1	1	1	1	1	1
32	1	1	1	1	1	1
36	1	1	1	1	1	1
Total Observed	12/12	12/12	12/12	12/12	10/12	6/6
Total Fidelity Rating	64/66	96.9%				

Key: 1 = Observed / 0 = Not Observed

APPENDIX S
RESULTS OF DAILY REPORTS

Results of Daily Reports – Student 1

Question	% Response during One-on-One Sessions	% Response during Videotaped Sessions
How do you feel today?		
Excellent	28	71
OK	22	18
Not sure	22	0
Not so great	28	12
Terrible	0	0
Did you have any problems?		
Yes	11*	100
No	89	0
Passage 1 was…		
too hard	0	6
too easy	0	0
just right	100	94
Passage 2 was…		
too hard	11	0
too easy	0	0
just right	89	100
The reader is reading…		
too fast	6	0
too slow	6	0
just right	89	100
Overall impression		
Excellent	22	65
OK	61	35
Not sure	11	0
Not so great	6	0
Terrible	0	0

*He indicated problems with the headphones during session 7 and a problem stopping the recording on session 5.

Results of Daily Reports – Student 2

Question	% Response during One-on-One Sessions	% Response during Videotaped Sessions
How do you feel today?		
Excellent	0	0
OK	47	56
Not sure	18	39
Not so great	35	6
Terrible	0	0
Did you have any problems?		
Yes	0	0
No	100	100
Passage 1 was…		
too hard	12	0
too easy	0	6
just right	88	94
Passage 2 was…		
too hard	12	0
too easy	0	0
just right	88	100
The reader is reading…		
too fast	0	0
too slow	6	0
just right	94	100
Overall impression		
Excellent	0	0
OK	82	100
Not sure	18	0
Not so great	0	0
Terrible	0	0

Results of Daily Reports – Student 3

Question	% Response during One-on-One Sessions	% Response during Videotaped Sessions
How do you feel today?		
Excellent	11	0
OK	78	89
Not sure	0	11
Not so great	11	0
Terrible	0	0
Did you have any problems?		
Yes	0	0
No	100	100
Passage 1 was…		
too hard	6	6
too easy	22	0
just right	72	94
Passage 2 was…		
too hard	22	11
too easy	6	0
just right	72	89
The reader is reading…		
too fast	0	0
too slow	0	0
just right	100	100
Overall impression		
Excellent	11	0
OK	89	100
Not sure	0	0
Not so great	0	0
Terrible	0	0

Results of Daily Reports – Student 4

Question	% Response during One-on-One Sessions	% Response during Videotaped Sessions
How do you feel today?		
Excellent	44	78
OK	44	22
Not sure	11	0
Not so great	0	0
Terrible	0	0
Did you have any problems?		
Yes	6*	0
No	94	100
Passage 1 was…		
too hard	0	0
too easy	11	0
just right	89	100
Passage 2 was…		
too hard	6	0
too easy	0	0
just right	94	100
The reader is reading…		
too fast	0	0
too slow	0	0
just right	100	100
Overall impression		
Excellent	44	72
OK	39	28
Not sure	17	0
Not so great	0	0
Terrible	0	0

*She indicated difficulties with the headphones one time.

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