The purpose of this study was to examine the contribution of brief experimental analysis and single-case designs to a response to intervention (RTI) model for evaluating oral reading fluency deficits. Using a problem-solving approach, the RTI model involves identifying at-risk students, delivering interventions, and evaluating the effectiveness and the responsiveness of the interventions on student outcomes. Four students were identified as having low oral reading fluency, and the effects of their oral reading fluency scores were examined. After conducting a brief experimental analysis, an intervention package was developed for each student. Gains in oral reading fluency were monitored, as well as scores on standardized tests, classroom grades, scores on school-wide CBM benchmarking, and teacher acceptability/perceived effectiveness of the intervention package. Two of the four students’ growth rates exceeded that of their peers, and all four students passed the state reading achievement test.
USING BRIEF EXPERIMENTAL ANALYSIS
AND INCREASING INTENSITY DESIGN:
A DEMONSTRATION PROJECT FOR RESPONSE TO INTERVENTION

A Thesis

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Introduction

With increasing numbers of students qualifying for special education services, particularly in the area of learning disabilities, it is important that the method for identifying these students is empirically supported and valid. The number of students identified as learning disabled (LD) increased from about 1.2 million in 1979-1980 to 2.8 million in 1998-1999 (Vaughn & Fuchs, 2003). The current discrepancy model, which views a learning disability as a significant difference between a child's ability and their achievement is fraught with error. An alternative may be the response to intervention (RTI) model. Response to intervention is defined as the change in behavior or performance as a function of an intervention (Gresham, 2002). Children would qualify for special education services only if their performance in the classroom didn't change even after a number of validated interventions had been implemented (Gresham, 2001). Using brief experimental analyses of academic behaviors and increasing intensity research designs to evaluate specific interventions may be useful tools when deciding if a student fails to respond to interventions.

The current IQ-achievement discrepancy or "wait to fail" model of identifying children with learning disabilities relies on the use of IQ tests, which contribute little information regarding educational planning and implementing effective interventions (Gresham, 2001). The discrepancy model also fails to identify children who may be experiencing reading difficulties not because of a learning disability but rather because they have had limited or ineffective reading instruction (Gresham).

Recent changes in the Individuals with Disabilities Education Improvement Act (IDEA; PL 105-17) call for a change from classifying children to instead identifying resources for promoting functional outcomes (Jones & Wickstrom, 2002). In addition, the 2004 revision of IDEIA states that RTI data should be used as a part of the evaluation for special education to aid in identifying and determining eligibility and scientific, research-based interventions should be implemented as part of the evaluation process (Graner, Faggella-Luby, & Fritschmann, 2005). Using curriculum-based measurement (CBM) and brief functional analyses can provide important information for teachers and practitioners who are developing interventions for struggling readers. Brief assessment involves using abbreviated experimental analysis to directly test different interventions that can strengthen or enhance reading skills (Jones & Wickstrom). The information derived from the brief
assessment approach can yield valuable data regarding a student's response to intervention. This enables the teacher to directly link assessment to intervention.

As stated by Reschly & Ysseldyke (2002), there has been a call for a "paradigm shift" among schools and practitioners. Current practice of special education categorical diagnosis is deficit-focused. General education needs to move toward focusing more on how to enhance competencies (Reschly & Ysseldyke). A non-categorical approach allows more emphasis on collecting assessment data related to interventions that enhance academic achievement (Reschly & Ysseldyke). RTI is data driven and connects assessment with intervention.

The remainder of this chapter critically reviews contemporary literature in the areas of the IQ-achievement discrepancy model, response to intervention, curriculum-based measurement, and brief assessment. Many early studies point out the numerous flaws in the discrepancy model. Response to intervention will be discussed as an alternative to the discrepancy model. Other studies discuss using CBM as a valid and reliable method for determining oral reading fluency rates and brief assessment as an effective tool in identifying effective interventions to improve reading fluency. Finally, the role brief assessment can play in determining a student’s response to intervention will be discussed as well as the use of an increasing intensity design.

Review of the Literature

Identifying Learning Disabilities using the Discrepancy Model

Since the category was first established in 1977, regulations have been implemented to help identify children with learning disabilities (LD; Vaughn, Linan-Thompson, & Hickman, 2003). Since that time, the number of students identified as LD has increased more than 200% (Vaughn et al., 2003). According to Vaughn & Fuchs (2003), more than half of all students receiving special education services are classified as LD. Since the cost of educating a student in special education is almost twice that for general education, it is vital that these students be accurately identified (Vaughn & Fuchs, 2003). However, according to Vaughn et al. (2003), many students are misidentified or unidentified.

There has been much controversy in establishing criteria to determine LD placement. In 1975, Rutter and Yule proposed a model for identifying children as learning disabled when a "severe discrepancy" existed between IQ scores and achievement scores (Fuchs, Mock, Morgan, & Young, 2003). According to Gresham (2001), there are
four main methods used to compute this discrepancy: deviation from grade level, expectancy formulas, difference in standard scores (IQ and achievement measured on standardized tests), and a standard regression analysis. Most states have chosen to use the IQ-achievement model, but their definitions of discrepancy vary greatly (Fuchs et al., 2003).

There are many flaws in the IQ-achievement model. This model relies on the use of IQ tests, yet these tests do not provide useful information when dealing with preparing, implementing, and evaluating interventions (Gresham, 2001). Marston, Muyskens, Lau, & Canter (2003) also cite the question as to whether IQ tests are appropriate measures of potential or predictors of achievement in students. Also, there is no connection between the assessment used for identification and later interventions that are designed on the basis of this assessment process (Gresham, 2001). In other words, the information provided from IQ tests does not inform instruction. According to Vaughn & Fuchs (2003), this model assumes that the degree of discrepancy relates to the severity of the disability. It also assumes that classroom performance of students with a discrepancy is different from that of students without a discrepancy. These assumptions have not been empirically supported. Recent studies show that elementary students identified as poor readers with and without an IQ discrepancy perform in similar fashion on many cognitive tasks that are related to reading (e.g., Fuchs et al., 2003).

This model also represents a "wait to fail" view. Students have to perform poorly for years until their achievement scores are sufficiently below their IQ scores (Fuchs et al., 2003). Students with special needs then are not identified until later in their academic career when interventions are much less effective (Reschly & Ysseldyke, 2002). Another consideration is that many students with low IQ scores that are not significantly different from their achievement scores will never qualify as learning disabled (Fuchs et al.). Also, some students' low achievement may be due to poor instruction instead of a disability.

According to Vaughn & Fuchs (2003), the majority of students are referred for special education testing and possible placement by the classroom teacher. This process can be biased because it relies on classroom teachers' views of how students perform and also teachers' expectations for performance.

Many argue that the IQ-achievement discrepancy model should not be used to identify children with learning disabilities. However, there is no agreed-upon alternative. One alternative that is receiving attention is the response to intervention (RTI) approach.
One model proposed as an alternative to the IQ-achievement discrepancy model is identifying children as LD in terms of failure to respond to interventions (Gresham, 2001). According to Gresham (2001), this model does utilize a discrepancy, but the discrepancy is measured between pre and post intervention levels of functioning. Instead of relying on a difference between IQ and achievement, research-validated interventions would be applied, and children who don't respond to those interventions would be identified as LD (Fuchs, 2003).

According to Gresham (2001), there are three different RTI approaches to consider. The first is a predictor-criterion model that focuses on skills or processes that represent the best predictors of skills needed to learn to read. Phonemic awareness, phonetic segmentation, rhyme, letter coding, letter cluster, and word recognition are some of the best predictors of reading success (Gresham; National Reading Panel, 2003). Reading accuracy, rate, and comprehension are criteria used to evaluate reading proficiency. Also direct instruction models and strategy training models are teaching strategies that focus on skills that best predict reading performance (Gresham).

A second RTI approach is the dual discrepancy model where the student performs below the level shown by classroom peers as well as shows a learning rate significantly below that of classroom peers (Gresham, 2001). Three criteria are suggested for special education qualification: a dual discrepancy between the child's performance level and growth and those of peers must be shown, the child's rate of learning with adjustments made in the regular classroom must be insufficient, and the provision of special education must result in improved growth (Gresham).

Fuchs & Fuchs (1998) discussed the concept of using treatment validity to identify children as learning disabled. They proposed a four-phase model where the first phase is used to determine if the instructional environment in the classroom indicates an overall rate of responsiveness. For example, the mean growth rate of the students in a classroom is compared to other classrooms in the same building or district. Once the instructional environment has been verified, the second phase is used to compare individual students' level of performance and rates of improvement. If a child demonstrates a dual-discrepancy
where their performance and growth rate are below that of peers, then phase three is used to determine if the instruction in the general classroom can be adapted to meet the needs of the student. The final phase evaluates whether instruction in a special education classroom can be effective for the student (Fuchs & Fuchs). According to Fuchs & Fuchs, placement in special education is not warranted if it is not effective for that student.

A third RTI approach involves identifying students using methods consistent with applied behavior analysis (ABA) (Gresham, 2001). There is an attempt to understand why the child is experiencing academic difficulties in relation to environmental events that precede and follow student performance. Using this method, there are five hypotheses for inadequate student performance: the child doesn't want to do the work, the child hasn't spent enough time practicing the work, the child doesn't have enough help with the work, the child hasn't had to do the work in that way previously, and the child finds the work too difficult (Daly, Witt, Martens, & Dool, 1997).

Barnett, Daly, Jones, & Lentz (2004) propose that in order to develop a successful model for making decisions regarding special education placement, RTI must include certain qualities. There must be structured data-based problem solving and flexible service delivery, monitoring of student progress on socially valid outcomes, and focusing on what happens to students in actual classrooms (Barnett et al., 2004).

Kovaleski (2004) proposed using RTI as a means to determine special education eligibility using a 3-tier process. The first tier includes school-wide screening and intervention in grades K-12 to identify high-risk students. These screenings could include Dynamic Indicators of Basic Early Literacy Skills (DIBELS) or Problem Validation Screening (PVS) (Good & Kaminski, 2001; VanDerHeyden, Witt, & Naquin, 2003). PVS includes assessing the entire class through CBM screening, conducting direct observations, comparing same-class peers, assessing the effect of providing incentive for growth, and intervention conducted in the natural setting and monitored for integrity (VanDerHeyden et al., 2003). The students deemed high-risk would then be targeted to receive research-based interventions with ongoing progress monitoring. The second tier involves assessing the students’ response to interventions using team-based problem solving. Finally tier three evaluates the extent of the academic problem and assesses the need for specially designed instruction. A decision would then be made as to entitlement for special education.

Fletcher, Francis, Morris & Lyon (2005), reviewed the reliability and validity of four different approaches to the assessment of learning disabilities: aptitude-achievement
discrepancy, low achievement, intra-individual differences, and response to intervention. They found that a model that combines both an RTI and low achievement model to be both reliable and valid for use in identifying children with learning disabilities (Fletcher et al., 2005).

Research Involving Response to Intervention

The predictor-criterion approach was studied by Vellutino, Scanlon, Sipay, Small, Pratt, Chen, et al. (1996). First grade students were identified by their teachers due to low scores (15th percentile and below) on the Woodcock-Johnson Reading Mastery Test-Revised (WJRMT-R). At the beginning of the second semester of first grade these poor readers were assigned to tutoring and contrast (control) groups. The tutored children received one-on-one instruction for 30 minutes each day in which instruction focused on developing sight vocabulary, phoneme awareness, alphabetic principle, and phonetic decoding and writing skills (Vellutino et al., 1996). All children were again tested in the spring with the WJRMT-R and divided into four levels of responsiveness: "very limited growth," "limited growth," "good growth," and "very good growth" (Vellutino et al., 1996). Two-thirds of the tutored children had caught up to their classmates and were reading at grade level. The remaining one-third was then described as "difficult to remediate" (Vellutino et al., 1996). These remaining students would then be considered for evaluation and placement in special education.

One study by Vaughn et al. (2003) used an RTI dual-discrepancy approach with 45 second grade students identified as poor readers. The students were provided with daily supplemental reading instruction for approximately 35 minutes each day. The reading intervention focused on phonemic awareness, phonics with emphasis on sound-letter relationships and word families, fluency, instructional reading level, comprehension, and spelling. The interventions were modified as students were assessed and progressed. After 10 weeks, 10 students met exit criteria, while 14 left after 20 weeks, and 10 left after 30 weeks (Vaughn et al., 2003). Eleven students failed to meet exit criteria and were determined to need extensive supplemental instruction in order to benefit from general education. This research shows that it is possible to identify a group of students who require much more intense instruction and should be considered for placement in special education using an RTI model.

According to VanDerHeyden & Witt (2001) RTI has many advantages. RTI allows for implementation of interventions for at-risk learners, which benefits students and
teachers. This proactive approach allows early identification of at-risk children and helps establish a baseline for measuring growth (VanDerHeyden & Witt). RTI also helps ensure more accurate decision making as there is no reliance on subjective teacher referrals (VanDerHeyden & Witt). Over-identification errors are also reduced. VanDerHeyden & Witt also state that RTI leads to less restrictive interventions and placements for students. Vaughn & Fuchs (2003) cite the connection between LD assessment and instructional planning and progress monitoring as an advantage of RTI. In addition, an RTI approach can reduce special education costs by lessening the number of false-positive identification, and increase accountability for student learning in both general and special education classrooms by measuring both growth rates and levels of achievement (Graner et al., 2005). Danielson, Doolittle, & Bradley (2005) state that RTI reinforces the direct link between assessment and instruction, and can be very useful to teachers when making instructional decisions to meet the needs of their students.

A recent article by Mastropieri & Scruggs (2005) stated that in order for an RTI approach to be successful, schools must work to ensure that all students are assured an evidence-based instruction and that supplemental procedures be put in place for all students that fail to show growth in such a setting. Another recent article by Marston (2005) explored the numbers of tiers needed with an RTI approach to achieve acceptable prevention outcomes. This article indicated that utilizing a three-tier approach to RTI had significant impact on student achievement in reading. In addition Christ, Burns, & Ysseldyke (2005) advocate the use of an RTI-problem analysis approach that emphasizes intervention-linked assessment and evaluation. This article also stresses that environmental conditions that are directly related to the related to the referral problem should be considered when designing effective interventions.

Curriculum-Based Measurement (CBM)

RTI is grounded in data-driven decision-making. One valuable tool used to obtain the data on academic skills is curriculum-based measurement (CBM). CBM was developed and used to assess skills in the areas of reading, math, and written expression. In addition, many studies have been conducted to verify that reading CBM has strong technical qualities and is a valid and reliable measure of reading skill (Marston, 1989).

Since most of the referrals met by school psychologists involve reading difficulties, it is important that reading progress is measured with a valid and reliable instrument (Makin, Rotz, & Young, 2004). The validity and reliability of CBM has been well
researched. CBM is easy to administer and score, has good treatment validity, and also has good reliability and validity (Hosp & Hosp, 2003). Treatment validity refers to the ability of an assessment to inform, promote, and document program effectiveness (Elliott & Fuchs, 1997). CBM was first developed to help test the effectiveness of special education instruction (Deno, 2003). CBM specifies procedures for sampling measures from the local curricula, for administering and scoring those assessments on a regular basis, and for summarizing and interpreting the data collected during assessment (Elliott & Fuchs, 1997).

In the area of reading, CBM measures oral reading fluency by having the child orally read a passage chosen from that school's curriculum or a passage that has been developed to match the child's instructional/grade level. The child's score is based on how many words were read correctly during a one-minute interval (Shapiro, 2004). Since oral reading fluency is a predictor of overall reading competence and reading comprehension, CBM is a valuable tool for measuring this reading skill (Makin et al., 2004). In addition, the National Reading Panel (2003) states that fluency helps bridge the gap between word recognition and comprehension, and it is vital in order for students to master the skills necessary for reading. Deno, Mirkin, & Chiang (1982) suggest that oral reading fluency is one of the most valid and reliable measures of a child’s basic reading skills.

According to Fuchs & Fuchs (1997), CBM is able to combine fundamental ideas from traditional measurement theory and from principles of classroom based observation methodology. Also, CBM is beneficial because it is cost-effective, informs instructional planning and practice, eliminates bias, and helps students with the most pressing academic concerns (Fuchs & Fuchs). It provides vital formative progress monitoring which is necessary to determine student growth.

According to Shinn and Bamonto (1998), CBM can be used for three main purposes: dynamic indicators of basic skills, aid in making formative evaluations, and use in a problem-solving model to make an array of decisions. Since CBM is an empirically sound approach, it should be considered a valuable tool in developing interventions for struggling readers. However, CBM fails to identify how to intervene or what intervention to implement. Brief experimental analysis or brief assessment can help inform those decisions.
**Brief Assessment**

One way to develop interventions for struggling readers is through the procedure called brief experimental analysis or brief assessment. Brief assessment involves using an experimental analysis to directly measure problem behaviors while variables are manipulated (Daly et al., 1997). This approach is especially timely as recent changes in IDEA legislation call for a move toward identifying resources for supporting functional results (Jones & Wickstrom, 2002). According to Jones & Wickstrom (2002), the goal is to evaluate instructional variables that impact a targeted weak area so that immediate action can be taken.

The brief assessment model seeks to isolate and confirm several hypotheses for academic difficulty. These hypotheses are: the child doesn't want to do the work, the child hasn't practiced the skill enough, the child hasn't had the necessary help with the work, the child has never had to complete the work in that way before, or the material is too hard for the child (Daly et al., 1997). With brief assessment, there is a sequence of testing conditions which are based upon using brief and easy to implement instructional strategies that produce immediate gains, assessments that are sensitive to short-term growth, and presentation of test conditions based upon the child's level of learning (Daly et al., 1997).

When working with a child experiencing reading difficulties, a number of interventions are explored. Interventions are selected through functional or experimental analysis where the independent variable (i.e., the treatment) is manipulated while observing the effects on the dependent variable (i.e., the behavior of concern; VanAuken, Chafouleas, Bradley, & Martens, 2002). Interventions are implemented according to an instructional hierarchy in which each level of academic responding has a different procedure that will produce the most efficient means of achieving mastery (Daly, Lentz, & Boyer, 1996).

Interventions are based on an instructional hierarchy to determine the necessary elements of instruction based upon the student's competency at performing the skill (Daly et al., 1996). The different stages of the instructional hierarchy are acquisition, fluency, generalization, and adaptation (Daly et al., 1996). Strategies that aid in developing accuracy include modeling, prompting, and error correction. Techniques designed to promote fluency include reinforcement, drill, and practice. Generalization is enhanced through accuracy and fluency practice. Adaptation occurs when the student is exposed to
new situations that demand problem solving and creativity, and they are able to apply newly acquired skills (VanAuken et al., 2002). Interventions are also chosen based on their amount of adult involvement (least intrusive to most intrusive) and thus ease of implementation.

*Research Involving Brief Assessment*

Daly, Martens, Dool, & Hintze (1998) investigated brief assessment to examine its effectiveness and found it to be successful with academic problems such as oral reading fluency. They suggested this method could help evaluate interventions and rule out potentially ineffective treatments that fail to make immediate positive changes in student achievement (Daly et al., 1998).

In a study conducted by Daly, Martens, Hamler, Dool, & Eckert (1997) brief experimental analyses of reading skills was conducted with 4 children. Instructional treatments were combined until oral reading fluency improved (Daly, Martens, et al., 1997). Results showed that brief assessment could be utilized to implement different intervention treatments and could also be used to rule out ineffective treatments.

Noell, Freeland, Witt, & Gansle (2001) researched the brief assessment model and how precisely it would predict students' responses to interventions when implemented over days or weeks. Students' oral reading fluency improved in 83% of the brief analyses and suggested that brief assessment can be a practical way to select interventions for oral reading fluency (Noell et al., 2001).

Jones, Harmon, & Wickstrom (2001) investigated brief assessment and the effects of instructional variables on reading performance and also conducted an extended analysis of those variables. Five students were referred for reading problems through parental referral, and the children participated in a three-week summer tutoring program. Brief assessment was able to identify effective instructional variables for three of the children, while the extended analysis replicated the results and clarified the outcomes for the two remaining students (Jones et al., 2001).

VanAuken et al. (2002) studied the treatment utility of brief assessment where they identified the potentially least and most effective interventions for each student. The interventions included repeated practice, modeling, and providing easier materials, and different interventions were alternated during an extended analysis to evaluate their effectiveness (VanAuken et al., 2002). The study provided additional evidence that brief
assessments can discriminate between effective and ineffective interventions for oral reading difficulties (VanAuken, et al., 2002).

Daly, Murdoch, Lellenstein, Webber, and Lentz (2002) investigated brief assessment and the effects of interventions on oral reading fluency. They evaluated the effects of adding contingent rewards to improve student responding. They also used instructional passages and high content overlap (HCO) to measure generalization. This study did find strategies that increased the rate of responding for all students, yet all students had different responses to different combinations of treatments (Daly et al., 2002). The brief assessment method allows practitioners to make quick decisions regarding interventions and provides data which are useful to classroom instruction (Daly et al., 2002).

Jones & Wickstrom (2002) studied brief assessment with an alternating treatment design to assess the differential effects of the different treatments across time. They also implemented an extended analysis to evaluate the stability of brief assessment outcomes and the effects of different interventions on word acquisition and generalized reading performance (Jones & Wickstrom). This study showed that brief assessment did provide stable results and showed collateral increases in word acquisition and maintenance of skills to different passages (Jones & Wickstrom).

According to Wilber and Cushman (2005), brief experimental analysis can be utilized to select appropriate interventions. This study used brief experimental analysis to determine why a student was experiencing difficulty in the area of oral reading fluency based on the instructional hierarchy. Appropriate intervention was then designed and an extended analysis was conducted. Results indicated that this procedure resulted in growth in oral reading fluency over a five-week period.

A study conducted by Daly, Persampieri, McCurdy, & Gortmaker (2005) examined using brief experimental analysis to identify reading fluency interventions. The use of rewards, instruction, and a combination of the two were used to create the most efficient treatment package for each student. The study showed substantial improvement in reading fluency as a result of the intervention (Daly et al., 2005).

According to Duhon, Noell, Witt, Freeland, Dufrene, & Gilbertson (2005), using a brief experimental analysis can be beneficial in determining if academic concerns arise from a skill deficit or a performance deficit. A brief experimental analysis was
implemented and then hypotheses were developed based on the type of deficit. An extended analysis was then conducted to evaluate the link between assessment and intervention. Results indicated that use of the brief experimental analysis was able to distinguish between a skills deficit and a performance deficit (Duhon et al., 2005).

While brief assessment seeks to directly measure problem behavior while manipulating variables, one method of analyses that can be utilized while implementing brief assessment is single-subject, increasing intensity designs. This method allows for intervention decisions to be made at each step of implementation, with more intensive interventions used as needed (Barnett et al., 2004).

*Increasing Intensity Research Designs*

Single-case designs help identify the effects of variables on a specific behavior of a particular student and monitor the performance of the student during manipulation of the independent variables (Alberto & Troutman, 2003). They require repeated measures of the dependent variable while the behavior of the student is monitored over time, and the students’ performance is compared under different conditions or changes in the independent variable (Alberto & Troutman, 2003). According to Barnett et al. (2004), single-case designs will assist schools in using research-based methods to make decisions regarding special education placement (Barnett et al). Increasing intensity designs (IDD) are based on sequential interventions that are ordered on a continuum that builds in intensity (Barnett et al., 2004). Barnett et al. suggest that utilizing an increasing intensity design could help analyze interventions and aid schools' intervention teams in the decision-making process.

Past research involving RTI (e.g., Vellutino et al., 1996; Vaughn et al., 2003) has been conducted with larger groups of students but has not explored single-case designs. Additionally, they have not explored increasing intensity designs.

*Social Validity*

While some research has been conducted to show the utility of brief assessment, the concept of social validity is also an important consideration. For an assessment to be socially valid, it's goals, procedures, and effects must be acceptable (Wolf, 1978). The effects of the intervention should then carry over to other socially important measures of student progress. Measuring social validity can be accomplished by examining student
grades or scores on state-mandated tests of achievement, as well as through participant (teacher, student, child) perception gathered through rating scales.

One scale, the Behavior Intervention Rating Scale (BIRS), has been shown to be a valid measure of teacher perception of treatment acceptability and effectiveness (Elliott & Von Brock Treuting, 1991). In addition, Eckert & Shapiro (1999) compared the acceptability ratings of curriculum-based assessment and published norm-referenced tests and found that curriculum-based assessment was consistently rated as a more acceptable assessment method. Teachers indicated a strong preference for curriculum-based assessments as opposed to norm-referenced assessments across a variety of questions pertaining to assessment acceptability. This study indicated that teachers felt norm-referenced assessments were not an acceptable assessment of academic skills problems.

**Purpose of Study**

The purpose of this study was to explore single-case, increasing intensity designs with the brief assessment procedure, and to determine how they can be used in the development of an eligibility model for special education. As schools look for alternatives to the IQ-achievement discrepancy model in the identification of students with LD, more attention will be focused on RTI and how to measure student responsiveness.

This study was exploratory in nature and attempted to add to the development of a model on RTI in the area of oral reading fluency. Specific research questions included:

1. Did current findings confirm previous research that indicated brief assessment as accurate and useful in identifying interventions for oral reading fluency?
2. Did the addition of single-case, increasing intensity designs strengthen the identification of student intervention need and the potential for eligibility decision making?
3. Was the brief assessment intervention model acceptable to teachers and students?
4. Did intervention, using the BA and RTI models, contribute to improvement in general reading performance, as measured by CBM?
5. Did intervention, using BA and RTI models, contribute to gains in student performance in the classroom as measured by standardized reading achievement tests?

These questions were examined by four intervention cases on oral reading fluency.
difficulties. For each case, students were compared to their peers, a brief experimental analysis was conducted, and intervention packages were developed and implemented.
Method

Participants and Setting

The participants included three third grade students (Kyle, Heather, and Chris) and one fourth grade student (Jennifer) enrolled in an elementary school in a public school district in suburban, southwest Ohio. All four students were Caucasian. Participants included two male students and two female students. All students were receiving regular education instruction while two students (Heather and Chris) were receiving additional Title I reading services at the time of the project. The students were identified for the project by the building principal and the classroom teacher based on the results of a school-wide screening process. Written consent was obtained by the parent/guardian (Appendix A). Verbal assent was also obtained from the teacher and student.

Examiners

The examiners were two second-year graduate students enrolled in a specialist level school psychology program at Miami University. Both had received Master’s degrees in school psychology. They were trained in assessment and tutoring procedures through university courses in assessment and intervention, as well as through meetings with the thesis advisor. Training procedures included reading of literature, discussion, modeling, and practice.

Materials

Curriculum-based measurement (CBM) reading passages for use in this study were selected from a variety of reading series. The readability of each passage was determined using the Fry method Readability Graph which provided a general grade level using the number of sentences per 100 words and the total number of syllables per 100 words (Fry, 1977). Using this method, three sample passages were randomly selected and exactly 100 words were counted out. The number of sentences within the passage was counted, and the length of the last sentence was estimated to the nearest tenth (Fry, 1977). Then the number of syllables was counted. The average sentence length and average number of syllables was then plotted on the readability graph (Appendix B; Fry, 1977). If the passage did not meet the readability requirements of the grade-level, then the words were adjusted to have more or less syllables, and/or the number of sentences was adjusted (Fry, 1977). Passage readability was determined by hand and also with the use of a computer program designed to compute readability using the Fry formula.
Dependent Variables

Immediate and general CBM measures. Oral reading fluency was the main dependent variable of interest. General CBM measures were obtained after the first reading of the passage. These measures attempted to measure generalization of reading skills across time. Immediate CBM measures were recorded after implementation of the intervention. For example, a general CBM score would be obtained after the student reads a passage the first time, and then the student reads the passage 3 additional times as part of the intervention. The immediate CBM score would then be recorded on the 4th reading of the passage. The student read orally while the examiner followed along on a separate copy and marked any mispronounced or omitted words. If the child paused for more than 3 seconds, then the examiner instructed them to go on and the word was marked as incorrect. The examiner did not supply any correct words. Correct words per minute (CWPM) was obtained by subtracting the number of errors from the total number of words read during a 1-minute time period. The immediate CBM scores were recorded after implementation of the intervention.

Oral reading fluency growth rates. A growth rate of approximately 1 word per week was used as a reasonable goal for this study (Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993). It is reasonable to expect an average growth rate of 2 CWPM/week for grade 1, 1.5 CWPM/week in grade 2, and 1 CWPM/week in grades 3 and 4 between any two administrations of school-wide benchmark assessments. School-wide assessment of oral reading fluency conducted during the fall, winter, and spring of the school year was used to determine if this goal had been met. Growth rate was calculated by subtracting the 1st administration score from the 2nd administration score and then dividing by the number of weeks that passed between administrations (Deno, Fuchs, Marston, & Shin, 2001).

Ohio proficiency/achievement tests. Scores from the fall and spring administration of the Ohio standardized tests were recorded to show growth in overall reading competency. Scores on the test fell into 5 categories: Limited (285-384), Basic (385-399), Proficient (400-414), Accelerated (415-441), and Advanced (442-493). A score of 400 or higher met the established performance standard on the test (Ohio Department of Education Website, 2005).

Grades. The classroom teacher provided grades in reading during the mid-term and at the end of each quarter grading period to help assess growth in overall reading competency.
**Behavior Intervention Rating Scale (BIRS).** This 24-item scale was designed to measure treatment effectiveness and acceptability by asking the classroom teacher to rate different factors relating to the intervention on a 6-choice Likert scale ranging from *Strongly disagree* to *Strongly agree* (Appendix C; Von Brock & Elliott, 1987). According to Elliott & Von Brock Treuting (1991), the items covered such factors as:

"the rate of behavior change, level of behavior change, maintenance of behavior change, generalization to other behaviors and settings, and peer comparisons" (p. 44).

It has a reported reliability measured as Cronbach's alpha of .98 and adequate construct and content validity (Elliott & Von Brock Treuting, 1991). The scale includes 3 factors related to the intervention: acceptability, effectiveness, and rate of change. The acceptability scale is made up of 15 items, the effectiveness scale includes 7 items, and the rate of change scale includes 2 items. This scale was completed by the classroom teachers at the end of the program.

*Independent Variables*

The independent variables were the intervention conditions implemented during the brief assessment (i.e., incentive, repeated readings, listening passage preview/phrase drill, and easier material). Each of these conditions was implemented over the course of two tutoring sessions using grade-level material. These conditions will be described in detail below.

*Procedures*

The procedures of the study followed five phases.

*Phase I: Problem identification.* The purpose of this phase was to determine if the student was performing below the level of their peers, to determine if the child was performing below the literature-based norms, to determine if the student had a performance deficit versus a skills deficit, and to collect baseline data. During the problem identification phase, classroom teachers were interviewed and an interview form was completed (Appendix D). This helped clarify goals and procedures, and determined a schedule for observations, teacher updates, and tutoring.

The child’s performance was compared to peers and literature-based criteria by examining school-wide CBM benchmarking data in the areas of reading, math and written expression. Also a systematic behavioral observation during a reading instructional period
was conducted by the examiner. These data were used to validate the concerns of reading, as well as provide additional screening data.

The duration and dates of any existing formal remediation interventions was examined as well as mid-term and nine-week grades in those areas related to the referral concern. Dates and scores on any past proficiency/achievement tests were recorded.

One-on-one sessions occurred twice a week for 30 minutes in an attempt to establish a stable baseline of oral reading fluency. Six grade-level CBM reading passages, with appropriate breaks between administrations, were administered during each session. This continued until three stable baseline points were established with confirmation from the university supervisor. Weekly median scores were calculated and plotted. A stable baseline was indicated if no data point varied more than 20% from the mean of the baseline (Alberto & Troutman, 2003). CBM administration did not include any correction of child’s errors due to the fact that error correction would be evaluated during one of the brief assessment conditions. Once baseline had been established, a goal was determined. To calculate the goal, the most recent baseline data point was multiplied by 1.30 (30%). For each of the 4 students, the average length of this phase was 2 weeks (range 1 week to three weeks).

The completion of fidelity checklists (Appendix E) by examiners began at this point to ensure that steps were being completed accurately. Inter-observer agreement sampling also began. Graphs were created to display each baseline score in order to chart progress.

**Phase II: Problem analysis.** Once a stable baseline had been established, a brief experimental analysis was conducted to determine which intervention was most effective and least intrusive. An effective intervention was defined as one that demonstrated a 30% improvement over baseline.

The first experimental condition was providing an incentive (IN). Prior to reading, the child was shown rewards and was told that they would receive the reward if their reading met or exceeded their goal (Jones & Wickstrom, 2002). If the child met the goal, they received the reward. If they did not, they were given a consolation prize instead. This condition was conducted in order to see if the child had the skills but lacked motivation. There is empirical support showing that using incentives can help reading performance (Lovitt, Eaton, Kirkwood, & Pelander, 1971).

The second condition was repeated reading (RR). Here the child read the same passage aloud four times (Daly et al., 1998). No error correction was made and the first
three readings were not timed. Only the fourth reading was timed and scored. This condition was conducted in order to see if the child benefited from more opportunities to respond (i.e., more practice). Research has shown that the use of repeated reading can increase reading fluency and comprehension (Daly et al., 1997, Therrien, 2004).

The third condition was listening passage preview and phrase drill (LPP/PD). Here the examiner read the passage first to model fluent reading (VanAuken et al., 2002). The student then read the passage aloud while the examiner highlighted any errors on a separate copy. The examiner correctly read the error words to the student (Daly et al., 1998). Then the student read a phrase containing the error words three times while the examiner provided immediate error correction. This condition served to identify if the child benefited from modeling and error correction (Daly et al, 1998). Research has shown that using this method can enhance reading performance (Daly et al., 1997).

The final condition implemented was easier material (EM). Here the child read aloud for one minute from a passage that was one grade level lower than their current grade level. This condition served to identify if the student benefited from lowering the level of difficulty of the material (Jones & Wickstrom, 2002; see Appendix F for scripted instructions for all conditions). There is empirical support for using easier materials to increase reading performance (Gickling & Armstrong, 1978). For all participants, the brief assessment was conducted in 2 sessions across the span of 1 week.

Interventions were chosen using two criteria: 1) most effective (i.e., 30% above baseline and consideration of errors and 2) least intrusive in terms of classroom implementation. The intervention that is the most effective and least intrusive was chosen to implement during the treatment strength phase. A mini-reversal was implemented in an attempt to replicate the effects of the intervention. The mini-reversal included: 1) a return to baseline conditions to see if the effects of the intervention reversed (30% decrease from highest data point recorded during experimental conditions) and 2) replication of the effects when the intervention was implemented again (30% increase over reversal condition score). Across all participants, the duration of Phase II lasted an average of 2 weeks (range 1 to 3 weeks).

Phase III: Treatment strength. Tutoring sessions occurred an average of twice per week for 30-minute sessions using the single most effective treatment strategy. The goal for the student was to reach stable performance of immediate CBM measures. This was
determined by examining the last three immediate CBM data points (for example, the fourth reading during RR). The reversal point was included in those three data points. If the median of the last three points was 100 CWPM or above, treatment evaluation began. If the median was below 100 CWPM, the next least intrusive treatment strategy was added.

Data were continued to be graphed for visual examination until the student's performance had reached 100 CWPM or until the full package of treatments was being implemented. Fidelity checklists continued to be used and inter-observer agreement was monitored. For all participants, Phase III lasted an average of 2 weeks (range 1 to 4 weeks).

**Phase IV: Treatment evaluation.** An aimline was created from the median baseline point to the goal. The goal was set for 16 weeks from the start of the treatment session and was calculated by adding Fuchs et al. (1993) expected growth rate of +1 CWPM to each week of intervention since all participants were 3rd and 4th graders. For every condition that included either RR or PD, the general CBM weekly median score (first reading) and each immediate weekly median score (final reading) was graphed.

Tutoring visits continued twice per week. During the 30 minutes sessions, examiners implemented as many of the “ideal” treatment or packages (determined in Phase III) as possible. Fidelity checklists and graphing of general and instructional CBM scores also continued. Across all participants, Phase IV lasted an average of 18 weeks (range 9 to 26 weeks).

The treatment duration was determined using the general CBM score to evaluate progress. A three-point decision rule was used to assess progress against the aimline and determine the need to increase the intensity of the intervention. If three consecutive data points fell below the aimline, the treatment was evaluated to determine what steps needed to be taken next. This included adding another intervention or increasing the number of days.

**Phase V: Follow Up.** Dates and scores of any benchmarking or proficiency/achievement tests were recorded. Grades were analyzed at the mid-term and end of each nine-week grading period. The BIRS was also completed by the classroom teacher. A comprehensive report for both the school and parents was disseminated (see Appendix G for the report of one participant).
Design

This study utilized a multi-element research design during the brief assessment to examine the different treatment effects (Alberto & Troutman, 2003). Following the brief assessment, a multi-element, increasing intensity design was utilized to examine the effects of each of the interventions on the oral reading fluency rates of the students (Jones & Wickstrom, 2002).

Interrater Agreement

Each session was audiotaped and 34% of the sessions were listened to by an independent observer who scored the passages for CWPM and errors to obtain interrater agreement. Mean interrater agreement for CWPM was 99.3% (range 95% - 100%).

Treatment Fidelity

34% of the audiotaped sessions were listened to by an independent observer to ensure that each step was accurately completed to determine treatment fidelity. A fidelity checklist (see Appendix E) was also be used by the examiner during each tutoring session. These checklists ensured that the examiner correctly implemented each experimental condition during all phases of the study. This also ensured that the examiner gave the student correct instructions and that the student read the correct passage. Fidelity checklist interrater agreement averaged 100%.

Results

Problem Identification

Figure 1 displays the results of the Problem Identification phase for each of the four participants. Results show that three of the four students differ greatly from their peers in the area of oral reading fluency. Literature based criteria indicated that students should be reading 100 CWPM. In addition, through CBM scores, some students were found to differ from their peers in the areas of written expression and mixed math. Those areas were not addressed by this study. Classroom observations indicated that for three of the four students, on-task behavior did not differ significantly from their peers. The greatest difference was with Heather, who was on task 65% of the time while her peers were on task 89% of the time.

Problem Identification indicated that three of the four students had significant academic difficulty in the area of reading. Since three of the four students were comparable to their peers in the task engagement assessment of problem identification, engagement during instruction was not a concern for these students. Although Kyle did not
present with significant concerns in reading at the time this study began, he was referred for this study because his oral reading fluency scores had been well below his peers in previous years.

**Baseline.** The baseline median for each of the students is displayed in Figure 2. During baseline, the median correct words per minute (CWPM) scores were: Kyle 96 CWPM, Chris 62 CWPM, Jennifer 66 CWPM, and Heather 77 CWPM.

**Problem Analysis and Treatment Strength**

Following baseline, a brief experimental analysis was conducted to determine the most effective intervention for each student. Then treatment strength was determined. The results of the brief experimental analysis are shown in Figures 3.1 and 3.2.

Kyle read 96 CWPM during the baseline condition. With the incentive (IN) condition, Kyle read 112 CWPM. In the repeated reading (RR) condition, Kyle’s performance increased to 122 CWPM. In the listening passage preview/phrase drill (LPP/PD) condition, Kyle read 97 CWPM. In the easier material (EM) condition, Kyle’s CWPM was 126. Since the EM score did not satisfy the criteria for reversal, another baseline score of 110 CWPM was obtained. The RR condition was then replicated, and Kyle read 141 CWPM, meeting the criteria for replication. RR was then implemented during the treatment strength phase. Figure 3.1 shows the results for treatment strength for Kyle. Literature-based benchmarks require the median of the last three data points to be above 100 CWPM. Kyle’s performance while receiving RR twice per week met this criteria.

Chris read 62 CWPM during the baseline condition. After implementing the IN condition, Chris’s performance had a slight increase to 70 CWPM. Chris’s performance increased to 93 CWPM during the RR condition. In the LPP condition, Chris’s CWPM was 92 CWPM. Chris’s score during the EM condition was 94 CWPM. A return to baseline conditions resulted in a score of 38 CWPM. The RR condition was then replicated with a score of 115 CWPM, which satisfied the replication criteria. Since the RR condition was the least intrusive condition, it was chosen to implement during treatment strength. Figure 3.2 shows the results of treatment strength. Since Chris had scores of 97 and 60 CWPM, along with 115 during RR replication, in the treatment strength phase, the IN condition was added. His performance then rose to 110, 102, and 110 CWPM.
During the baseline condition, Jennifer read 66 CWPM. The IN condition showed a slight increase over baseline with a score of 76 CWPM. Jennifer’s fluency score rose to 110 CWPM during the RR condition, and 131 during the LPP condition. The EM condition decreased her performance to 84 CWPM. A return to baseline condition resulted in a score of 51 CWPM which satisfied the reversal criteria. The RR condition was then replicated, and Jennifer scored 126 CWPM, satisfying the criteria for replication. Figure 3.2 shows the results of treatment strength. Jennifer’s CWPM with the RR condition were 118, 73, and 128 CWPM. Since the median CWPM exceeded the literature-based benchmark of 100 CWPM, only the RR condition was needed to satisfy the criteria for this treatment phase.

During the baseline condition, Heather read 77 CWPM. With the IN condition, she read 60 CWPM. In the RR condition, Heather’s performance rose to 113 CWPM. During the LPP condition, she scored 77 CWPM. With the EM condition, Heather’s CWPM was 74 CWPM which satisfied the conditions for reversal. Since Heather’s performance during RR was 113 CWPM, that condition was replicated, and she scored 95 CWPM, which satisfied the criteria for using RR during treatment strength. Figure 3.1 shows the results for treatment strength. Heather’s performance during the initial treatment strength (RR only) was 94 and 91 CWPM. The IN and LPP conditions were added over the course of 2 weeks in an attempt to exceed the literature-based benchmark of 100 CWPM; however, Heather’s performance did not exceed this benchmark. After discussion with the classroom teacher, course instructors, and thesis advisor, it was determined that the treatment evaluation phase should begin using the RR, IN, and LPP conditions.

During the treatment strength phase, two cases (Kyle and Jennifer) required only the RR condition in order to reach the literature-based benchmark of 100 CWPM. For Chris to be able to reach the literature-based benchmark, the RR condition needed to be combined with the IN condition. One case, Heather, required an intensive package of RR, IN and LPP in order to meet the benchmark. While she did not meet the 100 CWPM goal, it was decided to move on to the treatment evaluation phase since she was close to the goal.

Treatment Evaluation

Treatment evaluation results are shown in Figures 4.1 and 4.2. Chris and Jennifer each received intervention two times per week. Kyle received intervention two times per week, but then sessions were reduced to once per week due to increased oral reading
fluency performance. Heather also received intervention two times per week, but sessions were increased to three times per week in order to help her obtain her goal. During this phase, all participants were made aware of their progress through their graphs. These graphs were shown to them on average of twice per month.

During the problem analysis phase, Kyle obtained a general median score of 96 CWPM. Therefore, his aimline was drawn to 112 CWPM after 16 weeks of intervention. After 12 weeks of intervention, Kyle’s general fluency scores were consistently well above the aimline. His highest general score was 131 CWPM, which occurred during his 10th week of intervention. It was then decided to lessen the intensity of his intervention package by having tutoring sessions occur once per week rather than twice. As seen in Figure 4.1, some of Kyle’s scores fell below the aimline, but were still above the literature-based benchmark of 100 CWPM. When scores did fall, the graph was shown to Kyle. He was told that intervention would be changed back to twice per week if scores continued to decline. After this discussion, his scores increased. After 22 weeks of intervention, Kyle continued to make steady progress along his aimline. The last two weeks of data show Kyle’s fluency scores during progress monitoring, during which no intervention took place. His scores during progress monitoring were 128 and 117 CWPM. Summary statistics indicate that this was an effective intervention. Percentage of non-overlapping data (PND) points achieved by this intervention was 87%, indicating an effective intervention (Mastropieri & Scruggs, 1998).

During the problem analysis phase, Chris’s baseline general weekly median was 62 CWPM. Therefore, his aimline was drawn to 78 CWPM for a 16 week intervention. Due to the ending of the school year, Chris was only able to participate in 11 weeks of intervention, and his aimline was altered to 73 CWPM. Chris’s first two general weekly medians were below his aimline; however, he only received intervention one day per week during these two weeks. As seen in Figure 4.2, all other weekly medians were above his aimline. His highest weekly median was 86 CWPM which occurred during the 8th week of intervention. Upon visual analysis, Chris made consistent progress throughout his intervention, with 82% of his weekly medians falling above his aimline. Summary statistics indicate questionable effectiveness of this intervention. The PND points achieved for this intervention were 67%, and were thus questionable (Scruggs & Mastropieri, 1998).
Jennifer’s general weekly median during baseline was 66 CWPM. Her aimline was set at 96 CWPM during a 16-week intervention. By the end of the intervention, 82% of Jennifer’s weekly median scores were at or above her aimline. Her highest score was 101 CWPM, which occurred during the 13th week of intervention. A visual analysis of Jennifer’s weekly median scores, shown in Figure 4.2, shows that she made consistent progress throughout the intervention. Summary statistics indicate the effectiveness of this intervention was questionable. The PND points achieved for this intervention were 61%, and were thus questionable (Scruggs & Mastropieri, 1998). Upon completion of the intervention, five weeks of progress monitoring occurred, where all intervention was withdrawn. During that time, 60% of Jennifer’s weekly median scores fell at or above the aimline.

Heather’s general median score during baseline was 77 CWPM. Her aimline was then drawn to 96 CWPM after 16 weeks of intervention. Due to the ending of the school year, Heather was only able to participate in 11 weeks of intervention, so her aimline was adjusted to 77 CWPM after 11 weeks. As shown in Figure 4.1, Heather’s general median fluency scores fell below her aimline for three consecutive weeks. Her lowest score was 66 CWPM, which occurred during the 9th week of intervention. Since she was already receiving a full intervention package of RR, IN and LPP, it was determined that her intervention intensity should be increased from two days per week to three. During the last two weeks of intervention, her general median scores were 69 and 75 CWPM. A visual analysis of Heather’s weekly medians indicated that Heather did make some progress, but was consistently below her aimline. She was the only case in this study that performed in that manner. She was also the only case that required an increase in the intensity of her intervention design. It should also be noted that Heather’s incentive was changed half way through her intervention to something Heather indicated would be more motivating (a gift card to the local shopping mall). Summary statistics indicate this was not an effective intervention. The PND points achieved by this intervention were 25% and thus were ineffective (Scruggs & Mastropieri, 1998). However, this statistic should be interpreted with caution as one of Heather’s baseline points was high (83 CWPM) as compared to others. This unduly influenced the outcome of PND.

Oral Reading Fluency Growth Rates

School-wide assessment of oral reading fluency as measured by curriculum-based measurements conducted during the fall, winter, and spring of the school year was used to
monitor fluency growth rates. Using these data helps to determine if the effects of the intervention generalized to other settings. Growth rate is the average number of correct words per minute per week a student increased in between assessments. As a reference point, it was determined that the average growth rate for all students at Fairfield South Elementary from Winter of 05 to Spring of 05 was +.67. The goal for the four participants was one word per week. According to Deno et al. (2001), a typical special education student achieves a growth rate of +.5 while highly effective special education instruction should produce a growth rate of +1.39.

From the fall of ’03 to the winter ’04, Kyle’s growth rate was +2.21. Between winter ’04 and spring ’04, his growth rate was +.87. Between spring and fall ’04, his growth rate was +.36. Intervention started after the fall CBM administration. From fall ’04 to winter ’05, Kyle’s growth rate increased to +.93. Between winter and spring of ’05, his growth rate decreased to -0.6.

Table 1.

Oral Reading Fluency Growth Rates

<table>
<thead>
<tr>
<th>Name</th>
<th>Fall 03-Winter 04</th>
<th>Winter 04-Spring 04</th>
<th>Spring 04-Fall 05</th>
<th>Fall 04-Winter 05</th>
<th>Winter 05-Spring 05</th>
<th>Exceeded +.67 (Peers)</th>
<th>Exceeded +1.39? (Highly Effective)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kyle</td>
<td>+2.21</td>
<td>+.87</td>
<td>+.36</td>
<td>+.93</td>
<td>-0.6</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Chris</td>
<td>+1.21</td>
<td>+0.6</td>
<td>-.32</td>
<td>+.73</td>
<td>+1.2</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Jennifer</td>
<td>+.71</td>
<td>-.07</td>
<td>-.05</td>
<td>+.80</td>
<td>-.07</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Heather</td>
<td>+1.21</td>
<td>+.27</td>
<td>+.23</td>
<td>0</td>
<td>+1.0</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Note. Bold indicates growth rate occurred during treatment period.

Between the fall of ’03 and the winter of ’04, Chris’s growth rate was +1.21. From the winter to the spring of ’04, his growth rate was +0.6. From the spring to the fall of ’04, Chris’s growth rate decreased to -.32. Between fall of 04 and winter of 05, his growth rate increased to +.73. Intervention began after the winter CBM administration. His growth rate from the winter to the spring of 05 increased +1.2.

Jennifer’s growth rate from the fall of ’03 to the winter of ’04 was +.71. Between the winter to the spring of ’04, her growth rate decreased to -.07. Between the spring to the fall of ’04, Jennifer’s growth rate was -.05. Intervention started after the fall CBM administration. Her
growth rate increased to +.80 from the fall of ’04 to the winter of ’05. From the winter to the spring of ’05, her growth rate decreased to -.07.

From the fall of ’03 to the winter of ’04, Heather’s growth rate was +1.21. Between the winter to the spring of ’04, her growth rate was +.27. Heather’s growth rate from the spring to the fall of ’04 was +.23. Between the fall of ’04 to the winter of ’05, there was no change in her growth rate. Intervention began after the winter CBM administration. From the winter to the spring of ’05, Heather’s growth rate increased to +1.0.

Ohio Achievement Tests

Three of the students were in 3rd grade and took the 3rd Grade Reading Achievement Test. Jennifer was in the 4th grade and took the 4th grade Reading Achievement Test. These standardized achievement tests are mandated by the state of Ohio and designed to show growth in overall reading competency. The results of the tests are shown in Table 2 below.

All four subjects scored in the proficient range on the spring administration of the Reading Achievement Test. Chris showed the most growth, gaining 44 points from the fall to the spring administrations. Kyle and Chris both maintained at the Proficient level, although their scores dropped slightly. Since Jennifer was a fourth grader, the test was only given in the spring. According to the Ohio Department of Education, the mean score for the spring 2005 administration for all 3rd graders in the state of Ohio was 414.

Table 2.

<table>
<thead>
<tr>
<th>Standard Score</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>March</td>
</tr>
<tr>
<td>Kyle</td>
<td>412</td>
</tr>
<tr>
<td>Chris</td>
<td>364</td>
</tr>
<tr>
<td>Jennifer</td>
<td>N/A</td>
</tr>
<tr>
<td>Heather</td>
<td>406</td>
</tr>
</tbody>
</table>

Note: Change refers to the amount of change in standard score or category level between the October and March test administrations.
Grades

Grades for each of the subjects in reading, language arts, and spelling were recorded as percentages during the three grading periods in the school year. Language and spelling were included because they both directly relate to reading instruction. The 1st grading period occurred in November, the 2nd in January, and the 3rd in March. Grades help monitor growth in overall reading competency. The results are shown in Table 3 below.

Table 3.
Grades in Reading, Language Arts, and Spelling

<table>
<thead>
<tr>
<th></th>
<th>Reading</th>
<th>Language Arts</th>
<th>Spelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kyle</td>
<td>90/85/91</td>
<td>NA/86/92</td>
<td>89/90/92</td>
</tr>
<tr>
<td>Chris</td>
<td>74/83/85</td>
<td>NA/80/87</td>
<td>98/98/94</td>
</tr>
<tr>
<td>Jennifer</td>
<td>70/76/76</td>
<td>80/81/83</td>
<td>89/92/85</td>
</tr>
<tr>
<td>Heather</td>
<td>89/93/91</td>
<td>90/92/91</td>
<td>92/92/92</td>
</tr>
</tbody>
</table>

All four students’ grades increased in the area of reading, with Chris showing the greatest and Kyle the smallest. In language arts, Kyle and Chris did not receive grades the first quarter as their teachers did not assess them formally. All four students’ grades increased in this subject. Kyle’s spelling grades increased slightly, Heather’s remained constant, and Chris and Jennifer’s grades declined slightly.

Behavior Intervention Rating Scale (BIRS)

Each classroom teacher was asked to complete a BIRS as a measure of treatment effectiveness and acceptability of the interventions (Von Brock & Elliott, 1987). Each item was scored on a six point scale with 1 = Strongly Agree to 6 = Strongly Agree. Four of the five rating scales that were sent out were completed. The results of all the scales were positive with the most positive results coming from Chris and Kyle’s classroom teachers. The means of each item are shown below in Table 4.

Kyle’s teacher rated 18 of the 24 items (75%) at a “6” or “Strongly Agree.” Kyle’s teacher rated five items as a “5” or “agree”. The only item rated as a “4” stated, “The child’s reading concerns were severe enough to warrant the use of this intervention.”
Table 4.

Behavior Intervention Rating Scale (BIRS) Means and Standard Deviations

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This was an acceptable intervention for the child’s reading concern.</td>
<td>5.5</td>
<td>.58</td>
</tr>
<tr>
<td>2. Most teachers would find this intervention appropriate for other reading problems.</td>
<td>5.5</td>
<td>.58</td>
</tr>
<tr>
<td>3. The intervention proved effective in improving the child’s reading skills.</td>
<td>5.25</td>
<td>.96</td>
</tr>
<tr>
<td>4. I would suggest the use of this intervention to other teachers.</td>
<td>5.5</td>
<td>.58</td>
</tr>
<tr>
<td>5. The child’s reading concerns were severe enough to warrant the use of this intervention.</td>
<td>5.25</td>
<td>.96</td>
</tr>
<tr>
<td>6. Most teachers would find this intervention suitable reading concerns.</td>
<td>5.5</td>
<td>.58</td>
</tr>
<tr>
<td>7. I would be willing to use this intervention in the classroom setting.</td>
<td>5.25</td>
<td>.96</td>
</tr>
<tr>
<td>8. The intervention would not result in negative side-effects for the child.</td>
<td>5.5</td>
<td>.58</td>
</tr>
<tr>
<td>9. The intervention would be appropriate for a variety of children.</td>
<td>5.75</td>
<td>.5</td>
</tr>
<tr>
<td>10. The intervention is consistent with those I have used in classroom settings.</td>
<td>5.5</td>
<td>.58</td>
</tr>
<tr>
<td>11. The intervention is a fair way to handle the child’s reading concerns.</td>
<td>5.75</td>
<td>.5</td>
</tr>
<tr>
<td>12. The intervention is reasonable for the child’s reading concerns.</td>
<td>5.75</td>
<td>.5</td>
</tr>
<tr>
<td>13. I like the procedures used in the intervention.</td>
<td>5.5</td>
<td>.58</td>
</tr>
<tr>
<td>14. The intervention is a good way to handle this child’s reading concerns.</td>
<td>5.25</td>
<td>.96</td>
</tr>
<tr>
<td>15. Overall, the intervention was beneficial for the child.</td>
<td>4.75</td>
<td>1.9</td>
</tr>
<tr>
<td>16. The intervention quickly improved the child’s reading skills.</td>
<td>4.25</td>
<td>1.7</td>
</tr>
<tr>
<td>17. The intervention produced lasting improvements in the child’s reading skills.</td>
<td>4.25</td>
<td>2.4</td>
</tr>
<tr>
<td>18. The intervention improved the child’s reading to the point that it did not noticeably deviate from peers.</td>
<td>4</td>
<td>1.4</td>
</tr>
<tr>
<td>19. Soon after the intervention started, a positive change in classroom performance was noticeable.</td>
<td>4.75</td>
<td>.5</td>
</tr>
<tr>
<td>20. The child’s reading fluency will remain at an improved level even after the intervention is discontinued.</td>
<td>3.75</td>
<td>1.9</td>
</tr>
<tr>
<td>21. The effects of the intervention will help the student in other academic areas.</td>
<td>5.25</td>
<td>.96</td>
</tr>
<tr>
<td>22. The child’s reading skills were closer to his/her peers after the intervention.</td>
<td>4</td>
<td>2.2</td>
</tr>
<tr>
<td>23. The intervention produced enough improvement in the child’s reading that it is no longer a concern.</td>
<td>2.75</td>
<td>1.5</td>
</tr>
<tr>
<td>24. Other concerns related to reading are likely to be improved by this intervention.</td>
<td>5</td>
<td>.82</td>
</tr>
</tbody>
</table>

Chris’s teacher rated 19 of the 24 items (79%) at a “6” or “Strongly Agree.” His teacher rated three items as a “5” or “agree”, and one item as a “4”. The only item to rate a “2” or “Disagree” was one that stated, “The intervention produced enough improvement in the child’s reading that it is no longer a concern.” In addition, Chris’s teacher commented that he was able to pass the 3rd Grade Reading Achievement Test, and she stated she
believed this was due in large part to the interventions he received. Heather’s teacher rated 13 items (42%) as a “5” or “Agree.” Three items were ranked as a “1” or “Strongly Disagree” indicating the teacher did not think the intervention produced lasting improvements in reading skills or that Heather’s reading skills were closer to that of her peers. Heather’s teacher did comment that while there was no significant increase in her oral reading fluency, her self-confidence in oral reading had greatly improved. Jennifer’s classroom teacher rated most items (88%) as a “5” or “Agree or a “4” or “Slightly Agree.” The only item rated as a “2” or “Disagree” was item 23 which states that the child’s reading is no longer a concern.

The three items with the highest average score (5.75) were, “The intervention would be appropriate for a variety of children,” “The intervention was a fair way to handle the child’s reading concerns,” and “The intervention was reasonable for the child’s reading concerns.” There were four items with the lowest average scores (4, 4, 3.75, and 2.75 respectively). Those items were, “The intervention improved the child’s reading to the point that it did not noticeably deviate from peers,” “The child’s reading skills were closer to his/her peers after the intervention,” “The child’s reading fluency will remain at an improved level even after the intervention is discontinued,” and “The intervention produced enough improvement in the child’s reading that it is no longer a concern.” In addition, the teachers rated the interventions as more acceptable than effective.

**Discussion**

*Interpretations of the Findings*

This research hoped to answer five different questions. The first asked if these findings would confirm previous research indicating the brief assessment was accurate and useful in identifying interventions for oral reading fluency. The results of this study did confirm these findings. With the exception of Heather, each participant had one treatment condition that was able to raise their oral reading fluency score above the 30% criteria. In Heather’s case, her scores did not go above the 30% criteria, but they did go above her baseline scores. Also, two participants showed an increase in their oral reading fluency growth rate that exceeded their peers, as evidenced by their school-wide assessments. This
growth rate that exceeded their peers, as evidenced by their school-wide assessments. This supports previous research suggesting that brief assessment is an effective method to use to identify interventions (e.g., Noell et al., 2001; Wickstrom & Jones, 2001).

The second question asked if the addition of a single case, increasing intensity design would strengthen the identification of student intervention need and would be useful in the eligibility decision-making process. The results of this study did confirm that the single case, increasing intensity designs did strengthen the identification of student intervention need. With the exception of Heather, each participant showed growth and consistently had scores at or above their aimline, and thus confirmed that they were receiving the most appropriate intervention to meet their needs. It is possible that Heather would have shown more progress if she were able to receive intervention 3 times per week for a longer period of time. Since none of these students had been referred to their school’s Intervention Based Services team, it was not able to be determined if the single case, increasing intensity design would aid in eligibility decisions for them. However, it would appear, based on their growth, that none of the students would need to be referred for consideration of eligibility. If a student were being considered for eligibility for special education, using a single case, increasing intensity design would be very beneficial because this process would help analyze the intensity of intervention required to help students achieve goals. The school’s intervention team would then be able to use that data in their decision making process. According to the 2004 revisions of IDEIA, RTI data should be used as part of special education evaluations (Graner et al., 2005). This type of single subject, increasing intensity design uses structured data-based problem solving and progress monitoring that can be used in making eligibility decisions (Barnett et al., 2004).

The third question sought to answer if the brief assessment was acceptable. The overall positive results of the BIRS confirm that it was acceptable. The overall mean response (1 = Strongly Disagree and 6 = Strongly Agree) was 5. The item with the lowest mean response was “The intervention produced enough improvement in the child’s reading that it is no longer a concern.” This indicates that while the interventions helped the subjects make gains in their oral reading fluency, it did not enable them to have the same oral reading fluency rate as their peers. Teachers rated the interventions as more acceptable than effective. This also adds to the knowledge that teachers consistently rate curriculum-based assessment more acceptable than norm-referenced assessments (Eckert & Shapiro, 1999).
The fourth question asked if the intervention contributed to gains in general reading performance as measured by CBM. The results of this study confirmed this as each subject, with the exception of Kyle, made gains in their oral reading fluency growth rate as measured by their school-wide assessment. The growth rate of Chris and Heather exceeded that of their peers from the fall to the spring of 2005. In this study, the brief assessment using curriculum-based assessments, allowed for the evaluation of instructional variables so that immediate action could be taken. Brief and easy to implement instructional strategies were implemented that produced gains for the students (Daly et al., 1997).

Finally, the fifth question sought to answer if the intervention contributed to gains in the child’s performance in the classroom, as measured by standardized reading achievement tests. The results of this study confirmed this. All four subjects achieved the proficient rating Ohio Reading Achievement Test. Caution should be used interpreting the results, as two students had already scored at the proficient level prior to beginning intervention. Chris showed the most gain, scoring a 364 in the fall and a 408 in the spring. He also rose from the Basic to Proficient level. While Heather and Kyle’s scores went down slightly from fall to spring, they remained at the Proficient level.

Limitations of Study

The results of this study should be interpreted with caution due to several factors. The first limitation is that, due to a small sample size, results of this study cannot be generalized to a larger population. The primary purpose of single-subject design is not to be able to generalize to a larger population, but to find an intervention that is best for each individual student.

Second, there may be other variables, outside of the intervention that could not be controlled for which contributed to gains in oral reading fluency. All of the subjects were referred because they were considered at-risk, so they may have already been receiving additional academic attention from their teachers. Two of the subjects were receiving additional reading instruction for 30 minutes each day in a small group setting. Other subjects may have made gains as a result of regular classroom instruction, outside tutoring, or parental involvement. Two of the students, Jennifer and Heather, were receiving additional reading practice with their parents as part of their regular homework assignments.
It is also difficult to reliably examine classroom grades as they are not standardized measurements. Growth in reading skills, as measured by classroom grades, is a variable that should be interpreted with caution.

Although every attempt was made to hold tutoring sessions twice per week, there were a few occasions during which that was not possible. Due to student absence, school holidays, or scheduling/school conflicts, there were some weeks where tutoring sessions occurred only once, or not at all. It could not be ensured that each student would receive tutoring on the same days per week with the same number of days between tutoring sessions.

In addition, the Treatment Evaluation phase of the intervention was shorter than ideal for two of the students, Chris and Heather. For Heather in particular, it was determined that her intervention be increased to 3 times per week. However, since the school year was ending, this increase was only able to be put into effect for the last two weeks of school.

Finally, there was nothing in place to measure the long-term effectiveness of these interventions. This study did address a way to measure immediate progress monitoring after the intervention was withdrawn for two students (Kyle and Jennifer). However, a procedure should be implemented to monitor student progress for the year following their intervention.

Directions for Future Research

It would be helpful to examine the long-term effects of the intervention. It would be interesting to continue to monitor the progress of each subject through CBM data collection at different points in future school years to see if they continue to make gains. Also, since the examiners only spent a limited amount of time at the school, it would be ideal if other faculty members could be trained in the brief assessment and intervention so that this process could continue after the examiners discontinued their work.

It would be beneficial to use the brief assessment model in conjunction with RTI for a student that is being considered for placement in special education. Since none of the students were being considered for placement, those decisions were never considered in the course of this study. However, when a student with reading difficulties is brought before the school’s Intervention Based Services (IBS) team, it would be useful to see if the brief assessment model and increasing intensity design could be used to assist the team in determining if the student did respond to the interventions suggested by this process. The
data could then be utilized and interventions analyzed to aid in the team’s decision-making process (Barnett et al., 2004).

In addition, it would be interesting to explore different interventions other than the ones employed during this study. Although these interventions did address the five hypotheses as to why students are experiencing academic difficulties (Daly et al., 1997), future research should be directed towards other interventions that may be even more effective in increasing oral reading fluency.
References


practice approaches in evaluating intervention outcomes for oral reading fluency.  

_NASP Communiqué_, 33, 12-13.


Figure 1.

Problem Identification

Legend

- Student
- Peers
Figure 2.

Baseline CWPM

![Reading Baseline Medians](image)

- Kyle
- Heather
- Chris
- Jennifer
Figure 3.1

Brief Experimental Analysis and Treatment Strength

Kyle

Legend

BL=Baseline
RR=Repeated reading
LPP=Listening passage preview/phrase drill
EM=Easier material
Figure 3.2

![Graph showing Chris's performance across different conditions and trials.](image)
Figure 3.3

![Graph showing Jennifer's performance across trials. The x-axis represents Trial # (1 to 10), and the y-axis represents Words per Minute. The graph includes data points for BL, IN, RR, LPP, EM, BL, and RR 2X/WEEK conditions. Jennifer's performance varies across these conditions, with notable peaks and troughs.]
Figure 3.4

Heather

Words per Minute

Trial #

BL  IN  RR  LPP  EM  RR 2X/WEEK  RR + IN 2X/WEEK  RR+IN+LPP

0  20  40  60  80  100  120  140

1  2  3  4  5  6  7  8  9  10  11  12  13  14  15
Figure 4.1.

General Weekly Median Scores with Aimline

Kyle

Weeks
Figure 4.2

Chris

BL  PA  RR+IN 2X/WEEK

Weeks

CWPM

1  2  3  4  5  6  7  8  9  10  11  12  13  14  15

1  2  3  4

0  20  40  60  80  100  120  140
Figure 4.3

[Plot showing the weeks for Jennifer with different phases labeled BL, PA, RR 2X/WEEK, and PM. The plot indicates variations in measurements over time.]
Figure 4.4

Heather

[Graph showing data points for Heather over time with different phases labeled BL, PA, RR+IN+LPP 2X/WEEK, and 3X/WEEK]
Dear Parent or Guardian:

Your child, _________________________________________, has been selected by his/her teacher to participate in an Academic Tutoring Program through Miami University’s School Psychology Program. This program will focus on enhancing the reading skills of your child by providing individual tutoring sessions (30 minutes each, approximately two days/week). As described on the attached Consent Form, the sessions will be provided by Miami graduate students and supervised by me, the university trainer. All tutoring will be held at your child’s school. The information gathered on your child’s tutoring performance will be part of a research project and supervised by me as well. We hope that the data collected during this project will generate useful information for parents and teachers in serving the needs of students with reading difficulties.

If you’d like to include your child in this tutoring program, please read and sign the attached Consent Form and return it to your child’s teacher at your earliest convenience. If you have any questions, please feel free to contact me or your child’s teacher.

Sincerely,

Katherine Wickstrom, Ph.D.
Assistant Professor
School Psychology Program
(513) 529-6624
wickstkr@muohio.edu
Purpose: The purpose of this tutoring program is to determine the most effective strategies for enhancing the reading skills of your child. Over the course of 25 weeks, your child will be provided individualized tutoring that is matched to his/her strengths. Tutoring will be provided by graduate students in Miami University’s School Psychology Program. It is hoped that the information gathered during this tutoring program may potentially generate more useful information for parents and teachers in serving the needs of students with reading difficulties.

Procedures: Your child will receive four types of tutoring: (a) providing rewards for increased performance, (b) providing practice in reading, (c) providing error correction and drill, and (d) matching the curriculum to your child’s reading skills. We will carefully assess which of these is the most effective in increasing oral reading skills. All 30-minute tutoring sessions will be held at your child’s school (approximately twice a week). These sessions will be scheduled with your child’s teacher. In addition, your child’s teacher will be interviewed and your child’s school records will be reviewed in order to obtain information on your child’s academic performance. Interviews and tutoring sessions will be audio-taped. Classroom observations will also be conducted in order to obtain information on the classroom environment. You, along with teachers, will be asked to complete a brief questionnaire at the end of the tutoring program.

Right to Privacy: In order to maintain individual confidentiality, written and tape recorded information will be coded and the identity of your child will remain confidential throughout the project. Information collected will be maintained in a private office at Miami University. Your child’s name will not appear on any record. However, a summary report will be provided to you and your child’s teacher(s) at the end of the tutoring program.

Participant’s Rights: You and your child’s involvement in this research project is voluntary. You have the right to withdraw from this project at any time. Withdrawal from this project will not adversely affect you or your child in any way. If you have any questions or concerns, or would like more information about the program, please contact your child’s teacher and/or the university trainer, Dr. Katherine Wickstrom (513-529-6624). If you have any questions regarding your rights as a participant in this project, you may also contact the Office for the Advancement of Scholarship and Teaching (529-3734 or <humansubjects@muohio.edu>) at Miami University.

I HAVE READ AND UNDERSTAND THE PURPOSE OF THE PROJECT, THE PROCEDURES INVOLVED, AND MY RIGHTS AS THE LEGAL GUARDIAN OF A PARTICIPANT. I AGREE TO ALLOW MY CHILD TO PARTICIPATE IN THIS PROJECT.

___________________________________________ __________________
Signature Date

___________________________________________
Child’s Full Name (please print)
Appendix B

Fry Graph for estimating Reading Ages (grade level)

Average number of syllables per 100 words

Average number of sentences per 100 words
### Appendix C

Adapted version of the
Behavior Intervention Rating Scale
(BIRS; Von Brock & Elliot, 1987)

Case # ______  Student _________________________ Date _______

**Directions**: Please circle the number that corresponds with your opinion regarding each statement.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This was an acceptable intervention for the child’s reading concerns</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. Most teachers would find this intervention appropriate for other reading problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. The intervention proved effective in improving the child’s reading skills</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. I would suggest the use of this intervention to other teachers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5. The child’s reading concerns were severe enough to warrant the use of this intervention</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. Most teachers would find this intervention suitable for reading concerns</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7. I would be willing to use this intervention in the classroom setting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. The intervention would <em>not</em> result in negative side-effects for the child</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9. The intervention would be appropriate for a variety of children</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10. The intervention is consistent with those I have used in classroom settings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11. The intervention is a fair way to handle the child’s reading concerns</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12. The intervention is reasonable for the child’s reading concerns</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>13. I like the procedures used in the intervention</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>14. The intervention is a good way to handle this child’s reading concerns</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>15. Overall, the intervention was beneficial for the child</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>16. The intervention quickly improved the child’s reading skills</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>17. The intervention produced lasting improvements in the child’s reading skills</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>18. The intervention improved the child’s reading to the point that it did not noticeably deviate from peers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>19. Soon after the intervention started, a positive change in classroom performance was noticeable</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>20. The child’s reading fluency will remain at an improved level even after the intervention is discontinued</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>---</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>21. The effects of the intervention will help the student in other academic subjects</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>22. The child’s reading skills were closer to his/her peers after the intervention</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>23. The intervention produced enough improvement in the child’s reading that it is no longer a concern</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>24. Other concerns related to reading are likely to be improved by this intervention</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Comments:
Appendix D

TEACHER INTERVIEW FORM

Name of Child: _______________________________________ Age: _____

Grade: ________ Grades retained (if applicable): ________________

Does the child have an identified disability (please describe)?: __________________________________________

Does the child receive Title I services?: ______________

Is the child on medication (please describe)? ______________________________________________________

Does the child require glasses or large print? __________

Please mark an “X” in the box that provides the best estimate of the child’s skills:

**Reading**

In the area of reading skills, this child is in what range compared to other children in your classroom?

<table>
<thead>
<tr>
<th>Lowest 10%</th>
<th>Lower 20-30%</th>
<th>Middle 40%</th>
<th>Upper 20%-30%</th>
<th>Highest 10%</th>
</tr>
</thead>
</table>

In terms of grade level expectations, this child’s oral reading skills are:

<table>
<thead>
<tr>
<th>Well Below Grade</th>
<th>Below Grade</th>
<th>At Grade Level</th>
<th>Above Grade</th>
<th>Well Above Grade</th>
</tr>
</thead>
</table>

**Written Expression**

In the area of writing skills, this child is in what range compared to other children in your classroom?

<table>
<thead>
<tr>
<th>Lowest 10%</th>
<th>Lower 20-30%</th>
<th>Middle 40%</th>
<th>Upper 20%-30%</th>
<th>Highest 10%</th>
</tr>
</thead>
</table>

In terms of grade level expectations, this child’s writing skills are:

<table>
<thead>
<tr>
<th>Well Below Grade</th>
<th>Below Grade</th>
<th>At Grade Level</th>
<th>Above Grade</th>
<th>Well Above Grade</th>
</tr>
</thead>
</table>

**Mathematics**

In the area of math skills, this child is in what range compared to other children in your classroom?

<table>
<thead>
<tr>
<th>Lowest 10%</th>
<th>Lower 20-30%</th>
<th>Middle 40%</th>
<th>Upper 20%-30%</th>
<th>Highest 10%</th>
</tr>
</thead>
</table>

In terms of grade level expectations, this child’s math skills are:

<table>
<thead>
<tr>
<th>Well Below Grade</th>
<th>Below Grade</th>
<th>At Grade Level</th>
<th>Above Grade</th>
<th>Well Above Grade</th>
</tr>
</thead>
</table>

**Academic Engagement**

This child’s participation and work habits are in what range compared to other children in your classroom?

<table>
<thead>
<tr>
<th>Lowest 10%</th>
<th>Lower 20-30%</th>
<th>Middle 40%</th>
<th>Upper 20%-30%</th>
<th>Highest 10%</th>
</tr>
</thead>
</table>

**Disruptive Classroom Behavior**

In terms of following classroom rules, this child is in what range in comparison to other children in your classroom?

<table>
<thead>
<tr>
<th>Lowest 10%</th>
<th>Lower 20-30%</th>
<th>Middle 40%</th>
<th>Upper 20%-30%</th>
<th>Highest 10%</th>
</tr>
</thead>
</table>

**Critical Social**

In the area of social skills, this child is in what range in comparison to other children in your classroom?

<table>
<thead>
<tr>
<th>Lowest 10%</th>
<th>Lower 20-30%</th>
<th>Middle 40%</th>
<th>Upper 20%-30%</th>
<th>Highest 10%</th>
</tr>
</thead>
</table>
**PROBLEM IDENTIFICATION (CONT.)**

Mark the general domain(s) that is your primary concern. For each marked area of primary concern, please mark specific skill areas for further assessment and intervention.

<table>
<thead>
<tr>
<th>General Domain</th>
<th>Skill Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>___ Word Recognition  ___ Phonics/Pre-literacy  ___ Comprehension</td>
</tr>
<tr>
<td>Writing</td>
<td>___ Fluency  ___ Dictation  ___ Spelling</td>
</tr>
<tr>
<td></td>
<td>___ Grammar/syntax  ___ Penmanship  ___ Paragraph construction</td>
</tr>
<tr>
<td>Math</td>
<td>___ Basic Add/Sub  ___ Basic Mult/Div  ___ Advanced Mult/Div</td>
</tr>
<tr>
<td></td>
<td>___ Geometry  ___ Fractions  ___ Applied Problems</td>
</tr>
<tr>
<td>Academic</td>
<td>___ Volunteers answers  ___ Classwork accuracy</td>
</tr>
<tr>
<td></td>
<td>___ Giving correct answer when called upon  ___ Classwork completion</td>
</tr>
<tr>
<td></td>
<td>___ Attending to other students when they answer  ___ Homework accuracy</td>
</tr>
<tr>
<td></td>
<td>___ Knowing appropriate placement in materials  ___ Homework completion</td>
</tr>
<tr>
<td></td>
<td>___ Following oral directions  ___ Following written directions</td>
</tr>
<tr>
<td></td>
<td>___ Note taking  ___ Study skills</td>
</tr>
<tr>
<td></td>
<td>___ Attending to teacher lecture  ___ Persisting on difficult tasks</td>
</tr>
<tr>
<td></td>
<td>___ Preparation/materials ready</td>
</tr>
<tr>
<td>Disruptive</td>
<td>___ Using free time  ___ Passive off-task</td>
</tr>
<tr>
<td>Classroom Behavior</td>
<td>___ Transitioning from one activity to another  ___ Out of seat</td>
</tr>
<tr>
<td></td>
<td>___ Responding to teacher/peer feedback  ___ Talking out</td>
</tr>
<tr>
<td></td>
<td>___ Accepting consequences for misbehavior  ___ Disturbing peers</td>
</tr>
<tr>
<td></td>
<td>___ Beginning work without delay  ___ Needs frequent help</td>
</tr>
<tr>
<td>Critical Social</td>
<td>___ Stealing  ___ Damages others’ property  ___ Exhibits thought disorders</td>
</tr>
<tr>
<td></td>
<td>___ Tantrums  ___ Obsessive-Compulsive  ___ Ignores teacher warnings</td>
</tr>
<tr>
<td></td>
<td>___ Physically assaults adults  ___ Inappropriate sexual behavior  ___ Uses obscene language</td>
</tr>
<tr>
<td></td>
<td>___ Self-abusive  ___ Teased, neglected, or avoided by peers</td>
</tr>
<tr>
<td></td>
<td>___ Extreme shyness  ___ Injures others with weapons</td>
</tr>
<tr>
<td></td>
<td>___ Sad affect/depressed  ___ Inappropriate affect/Cries  ___ Shows evidence of drug use</td>
</tr>
<tr>
<td></td>
<td>___ Physically aggressive  ___ Somatic complaints with peers  ___ Lack of interest in activities</td>
</tr>
<tr>
<td></td>
<td>___ Talks of suicidal thoughts</td>
</tr>
</tbody>
</table>
PROBLEM ANALYSIS

Motivation
Does child need numerous prompts to complete work?
Does work accuracy improve with extra incentives or praise?
Does work completion improve with extra incentives or praise?

Skill Fluency
Estimate time allowed each day for independent silent reading.
Is independent practice work completed (regardless of accuracy)?
Is homework completed (regardless of accuracy)?
Estimate time each day child spends reading aloud.
Does child participate during classwide instruction (e.g., choral responding, raising hand)?

Skill Acquisition
Estimate time each day spent in small group instruction.
Is child participation during classwide instruction (e.g., choral responding, raising hand) accurate?
Estimate time each day spent listening as others (e.g., peers, teacher) read aloud.
Is the child on-task during teacher instruction?
Is independent seatwork accurate (regardless of completion rate)?
Is homework accurate (regardless of completion rate)?

NEXT STEPS
Thank you for responding to these questions. In order to assess the severity of potential academic concerns, it is necessary to administer a 3-minute math exercise and a 3-minute writing exercise to the entire class. Would you be willing to administer these timed exercises?
A classroom observation will also be conducted to assess the child’s level of engagement. What is the best time to observe the child completing independent seatwork related to the area of academic concern?
Appendix E

Fidelity Checklist for BASELINE

Baseline
Session No. _____  Date: ___________________  Phase __________________
Selected passage. Code __________
__Instructions
Assessed instructional performance  CWPM:_____Errors ______  IOA: ______

Baseline
Session No. _____  Date: ___________________  Phase __________________
Selected passage. Code __________
__Instructions
Assessed instructional performance  CWPM:_____Errors ______  IOA: ______

Baseline
Session No. _____  Date: ___________________  Phase __________________
Selected passage. Code __________
__Instructions
Assessed instructional performance  CWPM:_____Errors ______  IOA: ______

Baseline
Session No. _____  Date: ___________________  Phase __________________
Selected passage. Code __________
__Instructions
Assessed instructional performance  CWPM:_____Errors ______  IOA: ______

Baseline
Session No. _____  Date: ___________________  Phase __________________
Selected passage. Code __________
__Instructions
Assessed instructional performance  CWPM:_____Errors ______  IOA: ______
Fidelity Checklist for
BRIEF ASSESSMENT

Incentive
Session No. _____ Date:_______________ Phase_______________
Selected passage. Code __________
Goal set: 1.30 X baseline median = ______
Reward coupon selected: ______________
__Instructions (make reference to goal)
Assessed instructional performance CWPM:____ Errors ______ IOA: ______
__Incentive provided if earned, or consolation reward if score exceeds previous high score, or no reward

Repeated Reading
Session No. _____ Date:_______________ Phase_______________
Selected passage. Code __________
__Student read instructional passage 3 times
__Instructions
Assessed instructional performance CWPM:____ Errors ______ IOA: ______

LPP/Phrase Drill
Session No. _____ Date:_______________ Phase_______________
Selected passage. Code __________
__Examiner read story once aloud while child follows along on copy.
__Student read aloud passage while examiner highlighted errors
__Student read phrase containing error three times each, with immediate correction MAX. 15 PHRASES
__Instructions
Assessed instructional performance CWPM:____ Errors ______ IOA: ______

Easier Material
Session No. _____ Date:_______________ Phase_______________
Selected lower grade level passage. Grade: _____ Code _______
__Instructions
Student read lower grade passage CWPM:____ Errors ______ IOA: ______

Replication Phase
Complete necessary conditions using a second Fidelity Checklist for Brief Assessment:
1. Reversal (if necessary): If effects of least intrusive, most effective condition are not reversed by EM, administer the least effective previous condition. “Reversed” = 30% decrease
2. Replication: Considering errors, administer the least intrusive, most effective condition. “Replication” = 30% increase over reversal condition score.
3. Extended (if necessary): If reversal or replication fails, extend brief assessment
Fidelity Checklist for
INCENTIVE

Incentive

Session No. _____  Date: ________________  Phase ________________

Selected passage. Code __________

Goal set: ___ Grade 1-2: 60 CWPM < 5 errors  or  ___ Grade 3+: 100 CWPM < 7 errors

Reward coupon selected: ______________

__ Instructions (make reference to goal)

Assessed instructional performance  CWPM:_____ Errors ______

IOA: ________

__ Incentive provided if earned, or consolation reward if score exceeds previous high score, or no reward

Notes

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Fidelity Checklist for
INCENTIVE

Incentive

Session No. _____  Date: ________________  Phase ________________

Selected passage. Code __________

Goal set: ___ Grade 1-2: 60 CWPM < 5 errors  or  ___ Grade 3+: 100 CWPM < 7 errors

Reward coupon selected: ______________

__ Instructions (make reference to goal)

Assessed instructional performance  CWPM:_____ Errors ______  IOA: ________

__ Incentive provided if earned, or consolation reward if score exceeds previous high score, or no reward

Notes
Fidelity Checklist for
REPEATED READING

Repeated Reading
Session No. _____ Date: _______________ Phase _______________
Selected passage. Code __________
Assessed general performance  CWPM _____ Errors _____  IOA: ______
___Student read instructional passage 2 times
___Instructions
Assessed instructional performance  CWPM:_____Errors _____  IOA: ______

Notes
Fidelity Checklist for LPP/PHRASE DRILL

LPP/Phrase Drill

Session No. _____  Date: ________________  Phase ________________

Selected passage. Code __________

Assessed general performance  CWPM _____  Errors ______  IOA: ______

___Examiner read story once aloud while child follows along on copy.

___Student read phrase containing error three times each, with immediate correction

___Instructions

Assessed instructional performance  CWPM:_____Errors ______  IOA: ______

Notes

Fidelity Checklist for LPP/PHRASE DRILL

LPP/Phrase Drill

Session No. _____  Date: ________________  Phase ________________

Selected passage. Code __________

Assessed general performance  CWPM _____  Errors ______  IOA: ______

___Examiner read story once aloud while child follows along on copy.

___Student read phrase containing error three times each, with immediate correction

___Instructions

Assessed instructional performance  CWPM:_____Errors ______  IOA: ______

Notes
Fidelity Checklist for
INCENTIVE + REPEATED READING

Incentive + Repeated Reading

Session No. _____  Date: __________________  Phase _________________

Selected passage. Code __________

Assessed general performance   CWPM _____   Errors ______   IOA: ______

Goal set: ___ Grade 1-2: 60 CWPM < 5 errors or ___ Grade 3+: 100 CWPM < 7 errors

Reward coupon selected: _____________

___Student read instructional passage 2 times

___Instructions (make reference to goal)

Assessed instructional performance   CWPM:_____   Errors ______   IOA: ______

___Incentive provided if earned, or consolation reward if score exceeds previous high score, or no reward

Notes
Fidelity Checklist for
INCENTIVE + LPP/PHRASE DRILL

Incentive + LPP/Phrase Drill
Session No. _____ Date: __________________ Phase __________________
Selected passage. Code __________
Assessed general performance CWPM ______ Errors ______ IOA: ______
Goal set: Grade 1-2: 60 CWPM < 5 errors or ___ Grade 3+: 100 CWPM < 7 errors
Reward coupon selected: _____________
___Examiner read story once aloud while child follows along on copy.
___Student read phrase containing error three times each, with immediate correction
___Instructions (make reference to goal)
Assessed instructional performance CWPM:_____Errors ______ IOA: ______
___Incentive provided if earned, or consolation reward if score exceeds previous high score, or no reward

Notes

Fidelity Checklist for
INCENTIVE + LPP/PHRASE DRILL

Incentive + LPP/Phrase Drill
Session No. _____ Date: __________________ Phase __________________
Selected passage. Code __________
Assessed general performance CWPM ______ Errors ______ IOA: ______
Goal set: Grade 1-2: 60 CWPM < 5 errors or ___ Grade 3+: 100 CWPM < 7 errors
Reward coupon selected: _____________
___Examiner read story once aloud while child follows along on copy.
___Student read phrase containing error three times each, with immediate correction
___Instructions (make reference to goal)
Assessed instructional performance CWPM:_____Errors ______ IOA: ______
___Incentive provided if earned, or consolation reward if score exceeds previous high score, or no reward

Notes
Fidelity Checklist for
INCENTIVE + REPEATED READING + LPP/PHRASE DRILL

Incentive + Repeated Reading + LPP/Phrase Drill

Session No. _____  Date: _______________  Phase _______________

Selected passage. Code __________
Assessed general performance  CWPM _____  Errors ______  IOA: ______

Goal set: Grade 1-2: 60 CWPM < 5 errors  or  ___ Grade 3+: 100 CWPM < 7 errors

Reward coupon selected: _____________

___Examiner read story once aloud while child follows along on copy.
___Student read phrase containing error three times each, with immediate correction
___Student read passage 2 times
___Instructions (make reference to goal)

Assessed instructional performance  CWPM: _____Errors ______  IOA: ______

___Incentive provided if earned, or consolation reward if score exceeds previous high score, or no reward

Notes
Fidelity Checklist for
INCENTIVE + REPEATED READING + LPP/PHRASE DRILL
+ PHONEME SEGMENTATION AND BLENDING

Incentive + Repeated Reading + LPP/Phrase Drill + Phoneme Segmentation and Blending

Session No. _____ Date: _______________ Phase ________

Selected passage. Code __________

Assessed general performance  CWPM _____ Errors _____ IOA: _______

Goal set: Grade 1-2: 60 CWPM < 5 errors or ___ Grade 3+: 100 CWPM < 7 errors

Reward coupon selected: ______________

___Examiner read story once aloud while child follows along on copy.

___Student read phrase containing error three times each, with immediate correction

___Student read passage a second time. Examiner scores.

___For first error, examiner covered entire word except the first phoneme, read phoneme to the child, prompted child to read phoneme. Next, examiner uncovered the next phoneme and repeated the modeling and prompt. Continue for entire word. Repeat for all errors.

___Instructions (make reference to goal)

Assessed instructional performance  CWPM:_____Errors _____ IOA: _______

___Incentive provided if earned, or consolation reward if score exceeds previous high score, or no reward

Notes
Appendix F

EXPERIMENTAL CONDITIONS

Baseline and all other conditions

1. Use the instructional passage.

2. Turn on audiotape. Record case #, experimental condition, session, passage code.


Say to the student: “(Point to the first word) When I say ‘go’ begin reading aloud at the top of this page. Read across the page [demonstrating by pointing] until I say ‘stop.’ Try to read each word. If you come to a word you don’t know, just skip it and go on to the next one. Be sure to do your best reading. Ready? (Make sure student understood your directions). Go.”

At 60-s mark, put a slash (/) after the last word. Say “stop” after approximately twice the number of words has been read

A. If the student makes an error, mark through the word on the scorer. Errors include mispronunciations, substitutions, and omissions. If the student hesitates for more than 3 seconds, tell them to “go on,” and count as an error. If the student skips an entire line, immediately redirect them back to the beginning of the line.

B. “Mistakes” that are NOT counted as errors are self-corrections, inserted words, dialect, and repetitions.

4. Repeat twice more.

5. Turn tape recorder off.

6. Scoring: Calculate the number of words read correctly. Calculate the number of errors.

7. Immediately after each session: Complete Fidelity Checklist and Data Collection Form. Plot median data point CWPM on graph. Label tape.

Cautions:

1. Do NOT supply the word!

2. If a student “spoils” administration, repeat another. Spoiling occurs if child is distracted for > 3 secs by a noise, a question, or refusals, or if the child skips an entire line after one redirection.

2. “Flip-flops” count as one error.
**Incentive**

1. Use instructional passage.

2. Determine proper goal from baseline.

   If baseline condition was 0 – 11 CWPM, goal is to increase by 4.

   If baseline median (or previous incentive condition) was 12 +, multiply by 1.4 (goal is to increase by 40%). For example, if baseline median was 21, goal is 29.

3. Present child rewards from “Goodie Bag.”

4. Before giving child reading instructions, tell the child:

   “Now I want to see how good you can read when I give you a goal. Last time you read _____ words right in one minute. This time, if you can get at least _____ words right in one minute I will give you a reward. What reward would you like to work for today?”

5. Give the child instructions for reading the passage (from baseline). These may be shortened.

6. Student reads instructional passage. Stop him/her them at approximately 40% past their baseline mean ( ______ CWPM).

7. If student achieves goal, provide reward. If student did not earn reward, provide them with encouragement and a consolation reward.

8. Score errors and correct words per minute. Complete fidelity checklist.

**Repeated Reading**

1. Use instructional passage.

2. Tell the child:

   “Now I want to see how good you can read with extra practice. Read this story three times. If you get to a word you do not know, just do your best. I can’t give you the word, but I will listen carefully as you read.”

3. Have the student read passage three times. Stop them at approximately 40% past their baseline mean ( ______ CWPM). Provide no help, only encouragement.

4. With the instructional passage, give the child probe instructions (these may be shortened) and have him/her read for one minute.
5. Score errors and correct words per minute. Complete fidelity checklist.

**Listening Passage Preview/Phrase drill**

1. Use instructional level passage.

2. Tell the child:

   "*Now I want you to follow along while I read this story.*" Hand student copy of instructional passage.

3. Read the passage once at normal pace (approximately 100 words per minute) while student follows along.

4. Tell the child:

   "*This time I want you to read the story aloud while I listen.*"

5. Have the student read the instructional passage. Stop him/her at approximately 40% past BL mean (____ CWPM). Use a highlighter to mark errors.

6. After the student has completed the passage, point to each error on their copy and read the word to them (maximum 15 words).

   "*Let’s go over the words you had problems with… This word is ____. This is ____.*"

7. Have the student read short phrases that contain each error word three times, correcting errors immediately.

   "*Now, I want you to read each word that I point to. (Point to phrases). Again…*"

8. Use the instructional passage and give the student reading probe instructions (shortened).

9. Score errors and correct words per minute. Complete fidelity checklist.

**Easier Material**

1. Use lower level instructional passage.

2. Give the student probe instructions for reading the passage (these may be shortened).
3. Stop him/her at approximately 40% past BL (_____CWPM).

4. Score errors and correct words per minute. Complete fidelity checklist.
Jennifer is a 10-year-old student at Fairfield South Elementary. Jennifer was referred for intervention supports by the building principal due to problems related to oral reading fluency. Parental consent for these services was obtained from Jennifer’s parent in October of 2004. A review of Jennifer’s cumulative school folder revealed that Jennifer received reading instruction in the Reading Center beginning in 2\textsuperscript{nd} grade and throughout her 3\textsuperscript{rd} grade year. Her attendance record was unremarkable. There is no documentation of previous evaluations, and Jennifer has never been retained.

Jennifer’s teacher describes her as a pleasant student who gets along well with her peers. She consistently follows classroom rules and is attentive during instruction.

Assessment Strategies

Curriculum-Based Measurement (CBM). Curriculum-based measures are short-duration tests of proficiency in the areas of oral reading fluency, written expression, and math calculations. In reading, the child is asked to read aloud for 1 minute from three randomly selected grade level passages. Performance is summarized as the average number of words read correctly per minute. In written expression, a story starter (“My friends and I rode our bicycles to the pond.”) is provided, and the child is given 3 minutes to finish the story. Performance is typically summarized in terms of fluency (e.g., total words written, total correct word sequences per 3 minutes) and quality (e.g., percentage of correct word sequences). In math, a sheet of 25 mixed grade-level math operations is provided. Performance is summarized as the total number of digits correctly calculated during a 3-minute period. For each CBM measure, the child’s scores can be compared to classroom, school-wide, and/or literature-based standards. These measures were administered by the school three times throughout the school year.
**Teacher Interview Form (TIF).** The TIF is a structured teacher interview form that includes three sections. Section I requires the teacher to rate the child’s current level of functioning in six areas (reading, written expression, math, academic engagement, disruptive classroom behavior, critical social-emotional indicators), compared to classroom peers and grade level expectations. Section II is a checklist of more specific areas of concern. Section III is a functional assessment of the instructional environment.

**Observation.** A systematic behavioral observation was conducted during classroom reading instruction using the Behavioral Observation System (BOS). This system used 10-second intervals to record the occurrence of verbal and motor on- and off-task behaviors. These data were used to compare the student’s level of academic engagement as compared to her peers and literature-based norms.

**Record Review.** The student’s cumulative file was reviewed to collect pertinent information regarding her academic progress and intervention history. This aided in determining what level of support the student had received in the past.

**Cloze.** A Cloze passage was administered to the student to assess her level of reading comprehension. A Cloze passage was created by taking a 4th grade reading probe, leaving the first and last sentences intact, and deleting every 7th word from the passage and replacing each deleted word with a blank. Cloze is considered a measure of reading comprehension because correct replacements are created by means of logical analysis that make up comprehension.

**Problem Identification**

**Multi-skill, Multi-method Assessment.**

The teacher interview, benchmark history (Figure 1, bottom left), and Screening to Enhance Equitable Placement (STEEP) were used to help determine that reading fluency was an area of concern and needed to be targeted with intervention. The STEEP method used curriculum-based measures in reading, written expression, math, and data from a classroom observation of the student’s on-task behaviors. The student’s data were compared to her peers and literature-based benchmarks (Figure 1, top left).

The STEEP was used to show that the regular classroom instruction was effective and producing growth for the students. Jennifer was severely discrepant from her peers and the literature-based benchmarks in the areas of reading (Figure 1, top left).
reading, Jennifer’s score was 63 correct words per minute (CWPM), her peers’ scores were 112 CWPM, and literature-based benchmarks were between 70-100 CWPM. Data also indicated a discrepancy between the student’s score in math (6 correct digits) and that of her peers (12 correct digits). Jennifer was commensurate with her peers and literature based norms in the areas of written expression and academic engagement.

A Teacher Interview Form (TIF) was completed by the classroom teacher to determine if the student was discrepant from her peers and grade level expectations in the areas of reading, written expression, math, academic engagement, disruptive classroom behavior, and critical social-emotional skills. The teacher indicated Jennifer was well below grade level expectations in the area of reading and below grade level in writing. She also indicated reading comprehension as an area of concern.

A systematic classroom observation was conducted during reading instruction. During this observation, Jennifer was on task approximately 96% of the time, while her peers were on task approximately 89% of the time.

During collection of baseline data, tutoring sessions took place twice per week and lasted for 30 minutes. During each session, Jennifer read approximately six 4th grade level probes. Baseline data were collected for three weeks using 18-grade level probes. Her weekly averages for those three weeks were 66, 60 and 75 CWPM. This data confirmed the data from the STEEP model that Jennifer was severely discrepant from her peers in oral reading fluency.

The problem identified was oral reading fluency, and progress in this area was measured by CBM reading probes. Since oral reading fluency is a predictor of overall reading competence and reading comprehension, CBM is a valuable tool for measuring this reading skill.

Problem Analysis and Intervention Design

Brief Assessment.

A brief experimental analysis was conducted to directly test several hypotheses for academic difficulty. These hypotheses are: the child doesn't want to do the work, the child hasn't practiced the skill enough, the child hasn't had the necessary help with the work, the child has never had to complete the work in that way before, or the material is
too hard for the child. After collection of baseline data, the brief assessment was conducted with four intervention conditions: incentive, repeated reading, listening passage preview/phrase drill, and easier material. The purpose of the brief assessment was to determine the most effective intervention in increasing Jennifer’s oral reading fluency.

**Incentive (IN).** In this condition, prior to reading, Jennifer was shown rewards and was told that she would receive the reward if her reading met or exceeded her goal. If Jennifer met the goal, she would receive the reward. If she did not, she would be given a consolation prize instead.

**Repeated Reading (RR).** Jennifer read the same passage aloud four times. No error correction was made and the first three readings were not timed. Only the fourth reading was timed and scored.

**Listening Passage Preview/Phrase Drill (LPP/PD).** In this condition, the examiner read the passage first to model fluent reading. Jennifer then read the passage aloud while the examiner highlighted any errors on a separate copy. The examiner correctly read the error words to Jennifer. Then Jennifer read a phrase containing the error words three times.

**Easier Material (EM).** The final condition implemented was easier material (EM). Jennifer read aloud for one minute from a passage that was one grade level lower than her current grade level (i.e., 3rd grade).

The results of the brief assessment indicated that the most effective intervention was Listening Passage Preview/Phrase Drill (Figure 1, top right). However, since the Repeated Reading intervention was also effective, that intervention was chosen because it was less intrusive and easier to implement than LPP/PD. Based on these data, it was hypothesized that Jennifer needed more opportunities to practice to increase her oral reading fluency.

**Treatment Strength.**

This phase was conducted in order to determine the necessary strategies that were needed for an increase in Jennifer’s oral reading fluency. This was determined by examining the last three CBM data points. If the average of the last three points was 100 CWPM or above, treatment would begin. If the average were below 100 CWPM, the
next least intrusive treatment strategy would be added. During implementation of
Repeated Reading, Jennifer’s immediate CWPM did meet the goal of 100 CWPM. The
goal of the intervention was to increase Jennifer’s oral reading fluency rate by one word
per week. Since Jennifer’s baseline average score was 66 CWPM, a goal of 82 CWPM
over 16 weeks was established.

**Problem Evaluation and Decision Making**

During treatment, Repeated Reading was implemented during 30 minute tutoring
sessions that took place twice per week. Jennifer read the passage while the examiner
timed her. The score on the first reading passage was recorded as the general measure.
This score was meant to track oral reading fluency growth rate as it measured Jennifer’s
oral reading fluency over time. The immediate CBM scores were also recorded after
implementation of the intervention (e.g., the fourth reading of a passage during repeated
reading). The intervention was implemented and general and immediate scores were
obtained. Assessment began on November 10, 2004, and continued through the end of
the school year. The goal of the intervention was to increase her oral reading fluency to
82 CWPM over 16 weeks. Jennifer’s progress was monitored by graphing the weekly
average of her general CBM scores. It was decided that if three consecutive data points
fell below the aimline drawn from the baseline average (66 CWPM) to the goal (82
CWPM), the intervention would be altered.

**Treatment Integrity.** In order to ensure that the Repeated Reading intervention
was implemented as planned, the examiner completed a checklist of intervention steps
(see attached). Adherence to intervention steps was 100%.

**Results**

During treatment, Jennifer’s oral reading fluency showed continual growth. The
intervention was never altered, as general reading scores never fell below the aimline.
Her growth rate during the intervention was .94 words per week. Progress monitoring
took place for 5 weeks after the completion of the intervention. During that time, her
scores were consistent with her level during intervention (Figure 1, bottom right).

A Cloze passage was administered at the beginning and ending of treatment to
determine if the intervention was effective. Jennifer was given 5 minutes to complete the
blanks in the 4th grade level story. During baseline, she correctly completed 60% of the
blanks in the passage. After implementation of the intervention, Jennifer’s score on a different Cloze passage was 86%.

School-wide CBM oral reading fluency data was collected during the fall, winter and spring of the 2004-05 school year. Jennifer’s fall score was 68 CWPM. Her winter score was 80 CWPM, and her spring score was 79 CWPM (Figure 1, bottom left).

Jennifer’s grades in reading were reported by her classroom teacher, Mrs. Mavridoglou. Her first quarter reading grade was a 70%, her second quarter grade was a 76%, and her third quarter grade was a 76%.

A second Teacher Interview Form (TIF) was completed by Mrs. Mavridoglou after the completion of the intervention. Mrs. Mavridoglou indicated that Jennifer’s oral reading skills were still below grade level, as were her writing skills.

Recommendations

It would appear that Jennifer benefited from the Repeated Reading intervention, and it is recommended that this intervention continue twice per week next year. The results of the intervention indicate that Jennifer benefits from having more opportunities to practice reading. Since Jennifer gets along well with her peers, she could be paired with a peer tutor for this intervention. Jennifer would benefit from several other strategies to ensure her success in the area of oral reading fluency. Jennifer would benefit from visiting the public library during the summer and enrolling in their summer reading program. Reading during the summer months can help students maintain and continue their progress. Jennifer should also be provided with a summer reading list so that she has easy access to grade level materials. The more opportunities Jennifer has to read, the better reader she will become. Jennifer should also be encouraged to write during the summer months to help develop those skills. She could keep a journal, write letters to friends, or write short stories and poems.

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