ABSTRACT

PROBLEM VALIDATION SCREENING AND BRIEF ASSESSMENT: AN EXPLORATORY STUDY OF THE EFFECTS ON ORAL READING FLUENCY

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This study uses a single-subject, changing criterion design to investigate the results of combining Problem Validation Screening with the Brief Assessment Model in an extended analysis. The effects on oral reading fluency scores for six elementary-aged students were examined. The study includes examining academic screening information in the form of teacher interviews, curriculum-based measurements, and classroom observations. The study also includes examining brief assessment results for each child and results of individualized intervention tutoring over a period of 8-15 weeks. Three research questions are addressed: 1) Does Problem Validation Screening appear to validate referral concerns? 2) Can combining Problem Validation Screening with the Brief Assessment model be used as a method for linking problem identification, problem analysis, and problem evaluation? 3) What are the long-term effects of using the Brief Assessment Model on oral reading fluency?
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Introduction

It often occurs that a student will attend school to learn the expected academic subjects, and will be unable to keep up with his or her peers’ level of performance in one or more of these areas. Frequently reading is the primary skill of concern. Because reading ability is commensurate with the ability to do well in almost all other areas of school and because it is an essential skill to possess in our society, it is imperative that quality assistance is provided to children. An accountable method must be used to detect children requiring assistance at a young age and a valid and reliable intervention process implemented. The purpose of this study was to look at the results of combining the Problem Validation Screening process (VanDerHeyden, Witt, & Naquin, 2003) with the Brief Assessment model (Daly, Witt, Martens, & Dool, 1997) using the same student data sets of elementary-aged students referred for reading problems. A single-subject, changing criterion design was used. This is the first known study to be done that combined these two models and therefore has the potential to help provide valuable information about a process that could someday be adopted as a best practices method for determining special education eligibility. This study showed that connecting Problem Validation Screening with the Brief Assessment model provides a critical link that helps remove more subjective inferences about which children need extra help and which interventions or treatments will be most likely to help the child’s reading. This process is a systematic procedure that can more accurately identify students with reading problems and help them using the most productive, least intrusive empirically supported reading interventions. This research first used Problem Validation Screening in one elementary school to identify children with reading problems. Six of these referred students then underwent a Brief Assessment process to determine which of four empirically supported reading interventions showed a significant reading improvement. Once identified, this intervention in isolation (or combination of interventions) was implemented until the child reached individual reading goals. Last, the resulting combination was implemented with the child for 2-3 sessions per week in an extended analysis to examine generalized reading effects.

In the literature review that follows, the accuracy and usefulness of Problem Validation Screening will be discussed, as well as the benefits of using the Brief Assessment model. The
history of the Brief Assessment model will then be reviewed. Last, studies that have found success using the Brief Assessment process and limitations of these studies will be explained.

Literature Review

One of the most important jobs of a school psychologist is to assist in conducting the assessment of students that ultimately may lead to the referral and placement of these children in special education services. However, regularly children are misplaced into special education or do not receive the services when they are needed. This is often due to inconsistent referral and placement procedures (VanDerHeyden et al., 2003). Most of the time whether or not a child is classified is attributed to initial teacher referral and referral and classification are not objective processes (Algozzine, Ysseldyke, & Christenson, 1983; Ysseldyke, Vanderwood, & Shriner, 1997; VanDerHeyden & Witt, unpublished manuscript; VanDerHeyden & Witt, unpublished manuscript). Teachers usually refer a child based on how a child’s performance compares to his or her peers and whether or not the teacher feels that he or she will be able to close the achievement gap, given class size, responsiveness of the child, and available resources (Gresham, unpublished manuscript). These decisions are often influenced by variables such as a teacher’s emotional involvement in the situation (VanDerHeyden et al., 2003) as well as sociocultural and contextual factors (Gresham, unpublished manuscript). Algozzine et al. (1983) took this a step further by showing that most children referred by the teacher do end up being tested and then placed in special education (VanderHeyden et al., 2003). McMillan and Speece (1999) backed up these findings by showing that 52 to 70% percent of school-identified students classified as LD failed to meet special education eligibility criteria. School classification teams were not being consistent in basing their decisions on whether or not test data results met eligibility criteria (VanDerHeyden et al., 2003). Garrison and Hammill (1970) had similar findings in that 66% of students labeled as educable mentally retarded did not meet eligibility criteria for this classification category.

The Problem Validation Screening Process

Problem Validation Screening attempts to address these concerns by providing a reliable screening process that occurs before or simultaneously with teacher referral of a child, as well as providing data to indicate whether a further, more complete psychoeducational evaluation should occur (VanDerHeyden, et al., 2003). The Problem Validation Screening process is a gated assessment procedure that can be conducted school-wide twice per year to identify students who
are in need of further assessment to determine special education eligibility. It uses brief curriculum-based measurement (CBM) probes to assess children in the regular classroom, direct observations, comparison to same-class peers, assessment of the effects of providing a powerful incentive for improved performance, and an intervention conducted in a classroom setting. Intervention is monitored for procedural integrity (VanDerHeyden, et al., 2003). All children in the regular classroom take part in the first stage (CBM probes), but only children found to show poor performance participate in the second and third stages (use of incentives and instructional sessions) (VanDerHeyden & Witt, unpublished manuscript). Referral for further evaluation is based on the child’s response to intervention (i.e., failure to make sufficient improvement given an empirically supported assessment-based intervention in the classroom setting) (VanDerHeyden, et al., 2003). The CBM method used by the Problem Validation Screening process has been shown in several studies to be reliable and valid indicator of learning (Shinn, Collins, & Gallagher, 1998). Problem Validation Screening also saves time and provides fast service; the screening process requires only about 30-50 minutes, can leave a teacher with an intervention in place on the same day that the problem was referred, and greatly increases the likelihood that only appropriate cases are referred for a full assessment (Witt, 2001). Problem Validation Screening helps systems to stay in line with legal mandates by getting the required pre-referral interventions started. It also helps in situations where there is an overrepresentation of minority children in special education because it is an objective method for viewing referrals; it makes referrals less subject to factors like teacher tolerance or cultural disadvantage (Witt).

One study by VanDerHeyden, Witt, & Naquin (2003) found that Problem Validation Screening produced data with more acceptable properties as a screening tool and was a better predictor than teacher referral (negative predictive power for Problem Validation Screening was .95, and negative predictive power for teacher referral was .89). Also, teacher referral produced many more false positives (predictive power was .19) than the Problem Validation Screening process (predictive power was .53). Another study by VanDerHeyden et al. (2003) also found that compared to the other screening methods of teacher referral, the Comprehensive Inventory of Basic Skills-Revised (CIBS-R) (Brigance, 1999), and the Developmental Reading Assessment (DRA), Problem Validation Screening yielded either slightly better or much better predictive power estimates using the Criterion Assessment, the Iowa Test of Basic Skills, and the Woodcock-Johnson Psychoeducational Battery-Revised as comparison standards. In the same
study, Problem Validation Screening was found to have excellent negative predictive power, while producing reasonable levels of positive predictive power, and took half as much time to screen and perform follow-up assessments compared to DRA and CIBS-R.

The Brief Assessment Model

The Brief Assessment model also attempts to address the concerns of inconsistent and inaccurate referral and placement of children in special education by improving the required pre-referral intervention process (the last phase of the Problem Validation Screening process before a full evaluation is implemented). Behavior analysts have become increasingly interested in discovering efficient and reliable methods for evaluating and selecting useful interventions for children in the schools. The Brief Assessment model does this through linking assessment to intervention in a methodical, consistent manner, especially when it is used jointly with empirically supported academic intervention methods (Daly et al., 1997). A treatment is considered to be a good solution for a problem if there is a theoretical component that links the assumed cause of the problem to the treatment (Martens, Eckert, Bradley, & Ardoin, 1999). Traditional assessment data, however, are only able to provide detailed descriptions of a child’s behavior and therefore subjective inferences by school psychologists and other professionals are required to determine what an appropriate intervention would be for each child. Because it is necessary that an intervention be closely linked to the difficulty before it can provide assistance, relying only on problem descriptions can often be a problem for school psychologists and school-based teams (Martens, et al.). The Brief Assessment model also attempts to address the common dilemma of treatment integrity and progress monitoring during the pre-referral intervention process by requiring continuous data collection over time (VanDerHeyden, et al., 2003).

The Brief Assessment model also uses curriculum-based measurement (CBM) which has been shown to be a very useful measure of academic responding and has good psychometric properties (Daly, Lentz, & Boyer, 1996; Shapiro, 1996; Fuchs & Fuchs, 1998). CBM is a direct and frequent method of assessment that can be used to monitor a child’s progress over time. CBM procedures were developed to empirically analyze problems in academic performance using survey level assessment to determine placement and time-series analyses for evaluation of interventions (Daly et al., 1996). Results of CBM analysis render a baseline of oral reading fluency performance for each child, but do not provide information about which instructional
techniques are likely to be most effective in helping with their academic problems (Daly et al., 1996; Jones, Wolfe, Barnett, & Colquhoun, 2004). To use CBM to measure reading, usually a grade-level reading passage is administered to all children in a class, school, or district and the number of correct words read out-loud per minute is timed and recorded for each child individually. Each child’s score is then compared to his or her peers’ to determine if a discrepancy exists and extra help is needed (Shapiro, 1996).

The Brief Assessment model is also derived partly from the Instructional Hierarchy (Daly, et al., 1997). Because the purpose of CBM is not intervention development, but progress monitoring, the Instructional Hierarchy was a primary focus by Daly and colleagues (1997). The Instructional Hierarchy is focused on manipulating external factors to the child in a sequential manner that may be contributing to their academic failure. More specifically, proposed problems in the Instructional Hierarchy can be addressed one by one until one is found that matches the child’s area of deficiency. The least intrusive (least troublesome for the teacher to implement) intervention is tried first and the most intrusive intervention is tried last. The Instructional Hierarchy suggests five reasons that can be used to explain why a child has a reading problem and provides a starting point for generating hypotheses that can lead to effective interventions (Daly et al., 1997). These potential problems are: the child does not want to do the task, he or she has not spent enough time doing it, he or she has not had enough help to do it, he or she has not had to do it that way before, and it is too hard (Daly et al., 1997). Different interventions have been researched and empirically supported to target each of these problem areas. If a child does not want to do a task, it is considered to be a motivational problem and providing Incentives for improved performance has shown to be effective (Daly et al., 1997). If the child has not spent enough time doing a task, more practice and Repeated Reading of passages has shown to be effective (Daly et al., 1997). If a child has not received enough help doing a task or has not had to do it that way before, a teaching or modeling task is considered to be effective (i.e., “listening passage preview” or “phrase drill” interventions) (Daly et al., 1997), and if the material is too difficult for the child, using Easier Materials has shown to be effective (Daley et al., 1997).

The Brief Assessment model has taken the Instructional Hierarchy a step further and has placed its hypotheses and related interventions into an on-going, procedural, problem-solving model. The Brief Assessment model was initially created as a variation of experimental analysis (Daly et al., 1997). Experimental analysis was first used in the 1980’s by Iwata, Dorsey, Slifer,
Bauman, & Richman (1982) who began to use the process analyses in the assessment process for individuals with developmental disabilities and social behavior problems. They attempted to identify variables that contributed to severe behavioral problems through experimental manipulation of these variables. Various types of contingencies were manipulated in brief test conditions and effects on the problem behavior were observed (Daly et al., 1997). By adapting this experimental analysis design to address academic concerns, studies have shown more recently how brief experimental analyses can use similar processes as a way to quickly compare two or more treatment options in the school setting (e.g., Martens et al., 1999; Daly, Martens, Dool, & Hintze, 1998; Daly et al., 1999; Jones, Harmon, & Wickstrom, 2001; Noell, Freeland, Witt, & Gansle, 2001).

The Brief Assessment model is based upon a review of research supporting the use of interventions that are brief, easy to implement by teachers, that produce immediate and significant improvements in performance, and that use a theoretical model for sequencing the presentation of test conditions (such as CBM) that are sensitive to short-term gains in academic performance (Daly et al., 1997). The Brief Assessment model can also be used for the assessment of a variety of interventions for academic problems (Martens et al., 1999), uses a low level of subjective inferences, and is individualized to meet the needs of every child (Daly et al., 1997). Several studies support these findings.

Daly and colleagues (1998) applied the Brief Assessment design to three students referred for reading problems to examine its effectiveness at improving their oral reading fluency rates. Although each student had different problems and therefore required different interventions across experimental analyses, interventions that helped were found and a mini-replication design validated the results for each student.

Similar findings were found by Daly et al. (1999) and by Noell et al. (2001). In the study conducted by Daly et al. (1999), brief experimental analyses of oral reading fluency were also conducted. Procedures involved applying reading interventions in sequence to four participants who had been referred for reading problems. Following a baseline condition, interventions were combined with prior interventions until there was improvement in oral reading fluency in grade-level passages as well as passages with high content overlap (to measure generalization of learning). Different responses to intervention were obtained for each student and the results of
the study support that the Brief Assessment model has the potential to be conducted successfully with academic problems like oral reading fluency.

In the research completed by Noell et al. (2001) the predictive ability of the Brief Assessment model was studied on students’ responses to chosen interventions when they were carried out over an extended period of time (in a manner similar to classroom-based intervention). The assessment used an abbreviated reversal design and studied students’ oral reading from letter lists, word lists, and prose passages. First the student read out-loud without instruction to establish a baseline score. Next the student read with rewards available for improved reading. Third, the student read following a brief instructional intervention. These three procedures were then repeated to see whether or not the results would repeat across administrations. Last, an extended evaluation of the interventions was conducted for each student, lasting 3 to 4 weeks. Results were that in 83% of the brief analyses (10 of 12 conducted), oral reading fluency of students improved under at least one of the intervention conditions suggesting good treatment utility.

Jones et al. (2001), and Jones & Wickstrom (2002) also supported findings of other studies. Jones et al. (2001) conducted a Brief Assessment of the effects of different instruction methods on the reading performance of five children diagnosed with, or suspected of having a reading disability to determine which method would be the most effective overall. An extended analysis was then conducted on these same methods to measure effects of interventions over several sessions. The three common instructional methods that were used to increase reading performance across experimental conditions were providing incentives, passage preview, and using easier material. Results of the study showed passage preview to be the most effective and extended analysis replicated these findings.

Jones & Wickstrom (2002) analyzed the stability and parallel effects of treatment variables identified through the Brief Assessment model. This was done by first conducting a Brief Assessment on 5 children with reading problems. Using a multi-element design, the effects on oral reading fluency of an Incentive condition, Repeated Reading condition, Learning Trials condition, and Easier Materials condition were compared for each student. Once an effective strategy was found for each child, an alternating treatment design was used to look at the effects of its use over time, to look at rates of word learning, and to examine generalized effects of learning methods. Results showed that the effects of individual strategies were stable over time.
and that parallel effects on generalization passages occurred. This supported the notion that
effects from the Brief Assessment model are maintained over time and that generalization of
learning does occur.

Although much has been done to empirically support the use and outcomes of the Brief
Assessment model to assist with reading problems in the schools, there are several limitations in
the studies mentioned that will be addressed in the proposed study. First, two studies reused
reading passages during assessment, exposing children to some or all of the passages twice
(Jones & Wickstrom, 2002; Noell et al., 2001). This has the potential to yield inaccurate data on
treatment outcomes. Another study done by Jones et al. (2001) analyzed some form of learning
generalization as a result of the Brief Assessment model, as well as extended analysis to assess
long-term treatment effects. However, in agreement with Daly et al. (1998), and Eckert, Ardoin,
Daisey, & Scarola (2000), they suggest that more empirical support is needed in these areas.
Last, although a few of the studies helped to address this issue, Daly et al. (1999) suggest that
more research should also be done in the area of examining a variety of sequences of treatment
conditions for ordering treatments to measure and analyze effects. Noell et al. (2001) suggested
that more research should be done to examine agreement and overlap between brief and extended
analyses results.

The Proposed Study

Because both the Problem Validation Screening process and the Brief Assessment model
have been shown to be valuable in helping with the process of improving reading performance in
the school setting, linking the two should lead to an even more reliable and valid procedure and
may to assist in eligibility decisions. This is because there would be no break in the data set.
Instead, it is one continuous operation that uses the same data from screening through
assessment, through intervention, through eligibility determination. Linking Problem Validation
Screening and the Brief Assessment model has not yet been done prior to this study, so data
pertaining to this process are needed. Pertinent research questions include,
1) “Does Problem Validation Screening appear to validate referral concerns?”
2) “Can the Problem Validation Screening model and Brief Assessment model be used as
   a way to link problem identification, problem analysis, and problem evaluation?”
3) “What are the long-term effects of reading fluency using the Brief Assessment model?
Methodology

Participants and Setting

Participants included five third-grade children (Amy, April, Katie, Tammy, & Tim) and one fourth-grade child (Kristen) enrolled in Fairfield South (public) Elementary School in southern Ohio. All six children were from a suburban school district. One of the students, Amy, was African American. The other four students were Caucasian. Participants included one male and five females. Each child was selected by the school’s referral team (homeroom teacher, reading specialist, school psychologist, principal etc.) based on a school-wide screening process. Only one child, April, was receiving special education services during the time of the study. The school was involved in a collaborative arrangement with Miami University of Ohio and University of Cincinnati where university-trained graduate students enrolled in a specialist-level school psychology program provided supportive academic tutoring services to the school in exchange for field experience credits and/or as part of required thesis research projects. Informed, written consent for participation (Appendix A) was obtained prior to the study, as well as child assent.

Examiners

Examiners of this study included three school psychology graduate students from Miami University (including author). All three examiners had obtained master’s degrees in school psychology and had been trained in Brief Assessment and tutoring procedures through a graduate level class in assessment and intervention. Training involved discussion of research, demonstration, role play, and practice.

Materials

Reading Probes

Grade-level instructional passages from various reading series (e.g., Ginn Reading Series, Harcourt Brace & Company (2001) Collections) were used. Each selected passage was typed onto a single page keeping the fonts and spacing the same. Passages contained at least 100 words. In some passages, the text was slightly changed so that they were at the target grade level readability using the Fry readability scale (Fry, 1968). This scale indicates an approximate grade level based on the number of sentences per 100 words and the total number of syllables per 100 words. The Fry readability scale was used because it is able to accurately predict how readable a passage will be for a targeted grade level, is simple and easy to understand, and is
comprehensible by parents and teachers. It also corresponds well with other readability methods (Fry, 1968; Fry 1977).

**B.O.S. Protocols**

The B.O.S. (Behavioral Observation System) (Jones & Wickstrom, 1997) was used to record observations on the child’s behavior during classroom instruction. It was recorded whether or not the child was academically engaged, was off task, or was exhibiting inappropriate behavior. The B.O.S. measures on-task behavior of a student and a sample of his or her classroom peers. It also measures student and peers’ off-task behavior. It divides off-task behavior into the three components of passively off-task, behavior #1, and behavior #2. For behavior #1 and behavior #2, the observer chooses a problem behavior for each that student often exhibits. The B.O.S. also collects data on the teacher’s positive, negative, and neutral attention toward the student, as well as peer attention toward the student. These observations were conducted to determine task engagement, relative to the child’s peers in the class, and to determine whether or not class-wide problems existed. Active and passively engaged time and off-task behaviors were collected using a partial-interval recording system. Teacher directed instruction and peer behavior was also collected using a partial-interval recording system (Shapiro, 1996). Using this method, the examiner recorded whether the child was off or on task every ten seconds (prompted by beeps recorded in ten second intervals from a tape recorder with a “bug-in-the-ear” device), as well as which type of on or off behavior was being exhibited. See Appendix B for B.O.S. form.

**Dependent Variables**

There were three dependent variables of interest in this study: general CBM measures, immediate CBM measures, and oral reading fluency growth rate.

General CBM reading measures were measured by counting correct words read per minute (CWPM) and errors per minute (EPM) on the initial reading, before the intervention was conducted (EPM are defined as mispronunciations of words, word substitutions, word omissions, or if a child hesitates for more than three seconds on a word. If two words are “flip-flopped” when read, this counts as an error as well). This allowed the examiners to assess how the effects of the intervention conditions generalized over time to new passages.

Immediate CBM reading measures were the scores derived from the final reading measures of each passage. This measure was used to identify the least amount of treatment
necessary to increase immediate reading performance (as described in Procedures section below).

Using CBM oral reading fluency scores to establish growth rates for students has been found to be a measurement system that produces accurate, meaningful information with which to index standing and growth, and it can provide answers to questions about the effectiveness of programs in producing academic growth (Deno, Fuchs, Marston, & Shin, 2001). Oral reading fluency scores are defined as the number of words a student can read from a grade-level passage during a one-minute time period without help. Growth between CBM oral reading fluency scores were examined before and during the time that the tutoring sessions were implemented. Periodic school-wide benchmark assessments were completed three times per year (Fall, Winter, Spring) at Fairfield South Elementary for all third and fourth-grade students. The growth rate for each child was found by examining the difference between their first and last score (i.e., Fall Score to Winter score, or Winter to Spring score) and dividing this difference by the number of weeks between the first and last score. Growth rate scores for all participants were then compared to their peers’ average growth rate (Deno et al., 2001).

**Design**

The overall design in the first part of this study (Brief Assessment phase) was a single subject, within-subjects, multi-element design. A multi-element design is one that brings the same behavior (e.g., reading level of a student) under the control of several different experimental conditions that are each associated with a different intervention. The second part of the study (after the Brief Assessment phase) used a changing criterion design. A changing criterion design is one that shows experimental control by demonstrating that the only time the level of behavior changes (e.g., number of correct words read per minute) is when the criterion condition changes (e.g., Incentive condition, Repeated Reading condition, etc.) (Baily & Burch, 2002).

**Procedures**

**Problem Identification Phase**

To validate that each child had a reading problem and to determine specific areas of concern, three steps were conducted during the problem identification stage: a teacher interview, the Problem Validation Screening process (i.e., school-wide curriculum based measurement (CBM) assessments and a classroom observation), and establishing a stable baseline.
Teacher interview. For each child participating in the study, a teacher interview form was completed by the child’s reading teacher. This interview form provided information on teacher’s perceptions about the child’s reading, writing, and math abilities, as well as academic engagement, classroom behavior, and social skills. Specifically, the interview form asked the teacher to rate the child on what percentage of the class the child’s ability level fell into for each subject, as well as specific problem areas for each child. The teacher interview form was one piece of information used to assess problem areas. A follow-up teacher interview was also used to clarify goals and procedures, to schedule the observation, and to schedule tutoring times. See Appendix C for an example of the teacher interview form used.

Problem validation screening. Each child’s performance was then compared to peers and literature-based norms (e.g., Fuchs & Deno, 1982) using CBM measures in reading, math, and written expression administered to the child’s class. This administration was conducted by the school team during school-wide screening. The Behavior Observation System (B.O.S.; Jones & Wickstrom, 1997) was used by the experimenters to assess each child’s academic engagement (on-task behavior) in comparison to classroom peers. The purpose of this observation was to determine whether the child’s problem was performance (motivation) related or a skill problem.

Establishing a stable baseline. After rapport was established with the child, the attempt to establish a stable or non-escalating baseline was initiated. To do this, six CBM reading passages were administered to the child during each visit, with appropriate breaks for the child between passage administrations. Sessions to establish baseline were continued until baseline was determined to be stable. Each passage provided one score (CWPM) and therefore one data point. For every three data points obtained, the median CWPM was taken from these three points and plotted on a time-sensitive progress-monitoring graph. For the baseline to be stable all data points plotted had to be within a 20% variability range of each other. To determine variability of data points, the mean of the data points was found and multiplied by 20%. The product of this was then added to the mean and subtracted from the mean to find the range. If any of the data points fell outside of this range, the baseline was not considered to be stable and more data points had to be gathered until the baseline was stabilized (Alberto & Troutman, 2003). Without a stable baseline, it is not possible to determine if the child’s reading is improving during intervention phases as a result of the intervention, or if the improvement is instead due to
extraneous variables (i.e., the child would have improved on their own anyway without the intervention).

**Problem Analysis Phase**

In the problem analysis phase, a Brief Assessment was implemented in order to determine which intervention was the most effective and the least intrusive in helping the child’s reading to improve. The order in which the interventions were administered was as follows:

**Incentive.** The child was told that if they improved the number of words that he or she read correctly in one minute by 30% (multiply the child’s baseline median score by 1.3), he or she would be given the option of choosing one of three reward coupons. A novel instructional passage was used and the child was provided with only encouragement (no help) from the examiner. The three different reward coupons that could be chosen were a pink one with a picture of a telephone on it, a yellow one with a picture of a gift on it, or a green one with a picture of a medal/ribbon on it. The coupon with the telephone on it meant that the examiner would make a phone call home to the child’s parent(s) to tell them how well the child did with reading on that day. The coupon with the gift on it meant that the child could choose one of three small toys provided by the examiner. The coupon with the medal/ribbon on it meant that the child would earn a ribbon or certificate recognizing his or her good efforts. If the child did not reach his or her goal of increasing the number of correct words read per minute by 30%, he or she was provided with a consolation prize (a prize they did not choose). The Incentive condition was the least intrusive condition that could be implemented for the child in their classroom. If a child’s reading improved significantly (by 30% or more from baseline) as a result of this condition, it was hypothesized that a performance/motivational problem was present for the child.

**Repeated Reading.** The child was told that the examiner wanted to see how well he or she read with extra practice. The child was told to read a novel instructional passage four times. The examiner provided no help, only encouragement to the child during this condition and recorded the child’s number of correct words read in one minute during the fourth administration. The Repeated Reading condition was the second least intrusive condition that could be implemented for the child in the classroom. If a child’s reading improved significantly as a result of this condition, it was likely that the child had a fluency problem that resulted from not having enough practice to learn classroom material (Daley et al., 1997).
Listening Passage Preview/Phrase Drill. The child was told to follow along with his or her own copy of a novel instructional passage while the examiner read it out loud at a pace of approximately 100 words per minute. Afterwards, the child was told to read the same passage out loud while the examiner listened. The examiner used a highlighter to highlight all of the words that the child made errors on while the child was reading. When the child was finished reading, the examiner went over the highlighted words with the child and had the child read short phrases that contained each error word within the passage three times. The child’s new errors were corrected immediately. A maximum of 15 error words were reviewed with the child. Then the same passage was administered again, and errors and number of correct words read per minute were recorded. The Listening Passage Preview/Phrase Drill condition is the third least intrusive condition that can be implemented for the child in his or her classroom. If a child’s reading improved significantly as a result of this condition, it was likely that the child had a fluency problem that resulted from not having enough help to learn classroom material.

Easier Material. A lower level passage was administered to the child and errors and correct number of words read per minute were recorded. The lower level passage that was chosen was one grade-level below the instructional passages. The Easier Material condition was the most intrusive condition that could be implemented for the child in their classroom. This is because changing instructional materials to match each student’s instructional level can be difficult and time consuming for a classroom teacher. The teacher would have to prepare an entirely different teaching curricula for a new set of reading material. If a child’s reading improved significantly as a result of this condition, it was indicative that the instructional material was too hard for the child (see Appendix D for scripted instructions).

Results were graphed on an on-going basis and visually analyzed throughout the study. The purpose of visual analysis was to identify only those variables that have “clinically significant” rather than statistically significant effects. A mini-withdrawal (reversal) was conducted in order to rule out the possibility that the child’s reading improved due to extraneous variables. If the level of the most effective strategy had not already reversed (Easier Materials condition had not earned the lowest score), the condition in which the child received the lowest score was re-implemented, followed by a re-implementation of the most effective intervention strategy once again. If the level of the most effective strategy had already reversed (Easier Materials condition earned the lowest score), examiners administered the most effective
intervention once again. An effective intervention was one that earned a score that was 30% or more over the median of the baseline score. The most effective intervention also took into account intrusiveness and errors earned per minute.

*Treatment Strength Phase*

After the most effective strategy was determined, it was implemented again until its effects were stabilized (data points were within a 20% range of each other). If the median of the last three immediate data points for this condition were not above the grade-level literature-based norms (Fuchs & Deno, 1982), the most effective strategy was then combined with the other interventions (starting with the least intrusive condition once again and adding others as needed) until a combination was found that resulted in a reading score that reached the child’s goal performance (e.g., Repeated Reading + Incentive + Phrase Drill). Effective intervention packages were therefore individualized for each child and the number of times intervention packages were implemented varied for each child as well. Correct words read per minute were collected for each new intervention trial and recorded on the graph to determine the immediate effects of each intervention. While the immediate effects of the intervention combinations were being measured, the generalized effects were also measured by administering the passage used in each condition and recording errors and correct words read per minute first before implementing the intervention. Intervention packages were implemented for each child at a rate of two 30-minute sessions per week.

*Treatment Evaluation Phase*

When a combination of interventions was found that brought the child’s reading up to goal performance, this intervention “package” continued to be implemented and tutoring sessions with each child continued to occur twice a week. The examiner administered as many treatment sessions of the determined treatment strength intervention as possible during each 30-minute visit and graphed general scores.

An aim line and a goal performance line were created for each child in order to monitor progress on the child’s generalized reading effects. The goal performance line was determined by taking the rate of expected improvement for the child’s grade-level (increase in number of correct words read per minute), multiplying it by the number of weeks the child was expected to improve in over time (e.g., 16 weeks), and adding this product to the child’s baseline median. Fuchs, Fuchs, Hamlett, Walz, & Germann (1993) expected growth rate criteria was used: Grade
3-4: +1 CWPM/week. The aim line was created by drawing a line on the graph from the student’s baseline median score to the 16-week mark on the goal line (see Figures 8, 10, 12, 14, 16, & 18 for an example).

As another factor for increasing student motivation during the treatment evaluation phase, students were offered an incentive of a small laminated pie piece token when their general score for a passage landed at or over their aim line. When six of these pie piece tokens had been earned by a student, they were exchanged for a gift certificate for a free pizza at a local pizza restaurant. The graph was visually analyzed to determine the necessary treatment duration for intervention implementation. Treatment duration was determined by using a 3-point decision rule to evaluate each child’s progress against their plotted aim line. According to the 3-point decision rule, if general reading scores for the child resulted in three consecutive data points that fell below the aim line, the intensity of the intervention was increased (e.g. tutoring sessions changed from two to three times per week or another intervention condition was added to the child’s treatment package). Treatment duration was also determined through collaborative discussion and consensus between Miami University of Ohio and University of Cincinnati’s graduate team and Fairfield Elementary School’s administration. The general CBM score was used to evaluate each child’s progress.

Follow Up Phase

During follow up intervention data continued to be monitored. A comprehensive report for the school and the parents of the participating students were disseminated during a final meeting to inform them about the results of the study. In addition, a presentation was provided to the entire school staff on the process and results of the research project.

Procedural Integrity

To maintain integrity of experimenter administration, a fidelity checklist was completed for each reading trial administered to each child. The fidelity checklists provided spaces for the session number, date, code of reading passage, and student performance to be recorded. Fidelity checklists were filled out at a 98% accuracy rate for all participants (see Appendix E for example).

Inter-rater Agreement

All reading sessions were audio taped and coded by a secondary graduate student. The secondary rater listened to 42% of the audio taped conditions, and using an unscored passage,
independently tracked CWPM and EPM. The mean inter-rater agreement across sessions was 98% (range was 96-99%) agreement for the measure of correct words per minute (CWPM) and 90% (range 82-95%) agreement for the measure of errors per minute (EPM).

Results

**Problem Identification Phase**

*Results of Teacher Interview Form*

Results of the teacher interview forms for all six students indicated that they were significantly below their classroom peers in oral reading fluency skills. Results are shown in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Student</th>
<th>Teacher rating of student reading skills compared to classroom peers</th>
<th>Teacher rating of student reading skills compared to grade level expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>Lowest 10%</td>
<td>Well below grade level</td>
</tr>
<tr>
<td>April</td>
<td>Lowest 10%</td>
<td>Well below grade level</td>
</tr>
<tr>
<td>Katie</td>
<td>Lower 20-30%</td>
<td>Below grade level</td>
</tr>
<tr>
<td>Tammy</td>
<td>Lowest 10%</td>
<td>Well below grade level</td>
</tr>
<tr>
<td>Tim</td>
<td>Lowest 10%</td>
<td>Well below grade level</td>
</tr>
<tr>
<td>Kristen</td>
<td>Lowest 10%</td>
<td>Well below grade level</td>
</tr>
</tbody>
</table>

*Results of the Problem Validation Screening Model*

Similar to results found through teacher interviews, results for the Problem Validation Screening Model (using CBM oral reading fluency assessment) indicated that all six students were significantly below their classroom peers in oral reading fluency skills. In addition, some students were found through CBM scores to be below their peers in other areas as well. These areas included written expression and math fluency skills, though these areas were not addressed by the study. These results are shown in Table 2 and in Figures 1-6.

In addition, classroom observations conducted using B.O.S. protocols indicated that for five of the six students, on-task behavior in the classroom did not differ significantly from their
classroom peers. Amy, the sixth student, was the only student that was found to be significantly more off-task than her classroom peers. On-task behavior for classroom peers for all six students’ classes did not differ significantly from literature-based norms. These results provide preliminary data indicating adequate teacher control in the classroom.

Results of classroom observations using the B.O.S. are shown in Table 3, and in Figures 1-6.

Table 2
Results of Problem Validation Screening in Areas of Reading, Written Expression, and Math

<table>
<thead>
<tr>
<th>Student</th>
<th>CBM Oral reading fluency Score Fall, 2003 (CWPM)</th>
<th>3rd Grade Peer Norms at Fairfield South Elem. (CWPM)</th>
<th>Written Expression CBM (Total Words)</th>
<th>Written Expression Literature-based Norms (Total Words)</th>
<th>Mixed Math Fluency CBM (Digits Correct)</th>
<th>3rd Grade Peer Norms at Fairfield South Elem. (Digits Correct)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>58</td>
<td>100</td>
<td>22</td>
<td>33</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>April</td>
<td>48</td>
<td>100</td>
<td>27</td>
<td>33</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Katie</td>
<td>64</td>
<td>100</td>
<td>17</td>
<td>33</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>Tammy</td>
<td>55</td>
<td>100</td>
<td>33</td>
<td>33</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Tim</td>
<td>44</td>
<td>100</td>
<td>33</td>
<td>33</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Kristen</td>
<td>62</td>
<td>120</td>
<td>35</td>
<td>38</td>
<td>12</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 3
Results of Classroom Observation (Percent of Time on Task)

<table>
<thead>
<tr>
<th>Student</th>
<th>Student</th>
<th>Classroom Peers</th>
<th>Literature-Based Norms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>71</td>
<td>87</td>
<td>80</td>
</tr>
<tr>
<td>April</td>
<td>80</td>
<td>86</td>
<td>80</td>
</tr>
<tr>
<td>Katie</td>
<td>80</td>
<td>83</td>
<td>80</td>
</tr>
<tr>
<td>Tammy</td>
<td>97</td>
<td>97</td>
<td>80</td>
</tr>
<tr>
<td>Tim</td>
<td>83</td>
<td>77</td>
<td>80</td>
</tr>
<tr>
<td>Kristen</td>
<td>76</td>
<td>80</td>
<td>80</td>
</tr>
</tbody>
</table>
Figure 1. Amy’s Problem Validation Screening scores in comparison to classroom peers. Correct number of words read per minute are shown for Reading. Total number of words written is shown for Written Expression. Number of digits correct is shown for Mixed Math. Percentage of time on task is shown for Social. Dark horizontal lines indicate literature-based norms.

Figure 2. April’s Problem Validation Screening scores in comparison to classroom peers. Correct number of words read per minute are shown for Reading. Total number of words written is shown for Written Expression. Number of digits correct is shown for Mixed Math. Percentage of time on task is shown for Social. Dark horizontal lines indicate literature-based norms.
Figure 3. Katie’s Problem Validation Screening scores in comparison to classroom peers. Correct number of words read per minute are shown for Reading. Total number of words written is shown for Written Expression. Number of digits correct is shown for Mixed Math. Percentage of time on task is shown for Social. Dark horizontal lines indicate literature-based norms.

Figure 4. Tammy’s Problem Validation Screening scores in comparison to classroom peers. Correct number of words read per minute are shown for Reading. Total number of words written is shown for Written Expression. Number of digits correct is shown for Mixed Math. Percentage of time on task is shown for Social. Dark horizontal lines indicate literature-based norms.
Figure 5. Tim’s Problem Validation Screening scores in comparison to classroom peers. Correct number of words read per minute are shown for Reading. Total number of words written is shown for Written Expression. Number of digits correct is shown for Mixed Math. Percentage of time on task is shown for Social. Dark horizontal lines indicate literature-based norms.

Figure 6. Kristen’s Problem Validation Screening scores in comparison to classroom peers. Correct number of words read per minute are shown for Reading. Total number of words written is shown for Written Expression. Number of digits correct is shown for Mixed Math. Percentage of time on task is shown for Social. Dark horizontal lines indicate literature-based norms.
Problem Analysis Phase

Results of the Brief Assessment

Table 4

Results of Brief Assessment for all Students

<table>
<thead>
<tr>
<th>Student</th>
<th>Median Baseline Score</th>
<th>Initial condition-found to be 30% higher than Baseline median</th>
<th>Reversal score of chosen condition</th>
<th>Is reversal score 30% higher than previous trial’s score?</th>
<th>Intervention found to be most effective after reversal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>59</td>
<td>IN- 90</td>
<td>72</td>
<td>No</td>
<td>RR</td>
</tr>
<tr>
<td>April</td>
<td>40</td>
<td>RR- 58</td>
<td>76</td>
<td>Yes</td>
<td>RR</td>
</tr>
<tr>
<td>Katie</td>
<td>80</td>
<td>RR- 129</td>
<td>94</td>
<td>No</td>
<td>PD</td>
</tr>
<tr>
<td>Tammy</td>
<td>62</td>
<td>RR- 86</td>
<td>82</td>
<td>No</td>
<td>PD</td>
</tr>
<tr>
<td>Tim</td>
<td>44</td>
<td>PD-82</td>
<td>83</td>
<td>Yes</td>
<td>PD</td>
</tr>
<tr>
<td>Kristen</td>
<td>88</td>
<td>IN- 110</td>
<td>85</td>
<td>Yes</td>
<td>IN</td>
</tr>
</tbody>
</table>

Note. IN = Incentive, RR = Repeated Reading, PD = Listening Passage Preview/Phrase Drill, and EM = Easier Material.

Results for all six students are shown in Table 4. Individual student results were as follows:

Amy’s baseline score was 59 CWPM (correct words per minute) with five errors. Through the brief analysis process, the Incentive condition was found to be the least intrusive intervention that increased her oral reading fluency score to 30% or higher above her baseline score (90 CWPM). When a mini-withdrawal (reversal) was completed, Amy’s new oral reading fluency score in the Incentive condition was 72 CWPM. This score was no longer 30% or higher than the previous trial’s score of 65 CWPM. Therefore, the Repeated Reading condition was chosen because this condition was the second least intrusive and produced a score that was 30% above the previous trial’s score of 72 CWPM when a mini-withdrawal (reversal) was completed (111 CWPM) (see Figure 7).

April’s baseline score was 40 CWPM with five errors. Through the brief analysis process, the Repeated Reading condition was found to be the least intrusive that increased her
Figure 7. Amy’s brief assessment and Problem Analysis results. Data points across the bottom indicate errors per minute.

Figure 8. Amy’s Treatment Evaluation/Tutoring results. Data points represent the median general reading score for one week.
oral reading fluency score to 30% or higher above her baseline score (58 CWPM). When a mini-
withdrawal (reversal) was completed, April’s new oral reading fluency score using the Repeated
Reading condition was 76 CWPM. This new score was also 30% or higher above the previous
trial’s score of 41 CWPM. Therefore, the Repeated Reading condition was chosen because this
condition was found to be the most helpful, least intrusive intervention (see Figure 9).

Katie’s baseline score was 80 CWPM with one error. Through the brief analysis process,
the Repeated Reading condition was found to be the least intrusive intervention that increased
her oral reading fluency score to 30% or higher above her baseline score (129 CWPM). When a
mini-withdrawal (reversal) was completed, Katie’s new oral reading fluency score in the
Repeated Reading condition was 94 CWPM. This score was no longer 30% or higher above the
previous trial’s score of 102 CWPM. Therefore, the Listening Passage Preview/ Phrase Drill
condition was chosen because this condition was the third least intrusive and produced a score
that was 30% above the previous trial’s score of 94 CWPM when a mini-withdrawal (reversal)
was completed (136 CWPM) (see Figure 11).

Tammy’s baseline score was 62 CWPM with 16 errors. Through the brief analysis
process, the Repeated Reading condition was found to be the least intrusive intervention that
increased her oral reading fluency score to 30% or higher above her baseline score (86 CWPM).
When a mini-withdrawal (reversal) was completed, Tammy’s new oral reading fluency score in
the Repeated Reading condition was 82 CWPM. This score was no longer 30% or higher than
the previous trial’s score of 74 CWPM. Therefore, the Listening Passage Preview/ Phrase Drill
condition was chosen because this condition was the third least intrusive and produced a score
that was 30% above the previous trial’s score of Tammy’s 82 CWPM when a mini-withdrawal
reversal was completed (88 CWPM) (see Figure 13).

Tim’s baseline score was 44 CWPM with six errors. Through the brief analysis process,
the Listening Passage Preview/ Phrase Drill condition was found to be the least intrusive
intervention that increased his oral reading fluency score to 30% or higher above his baseline
score (82 CWPM). When a mini-withdrawal (reversal) was completed, Tim’s new oral reading
fluency score using the Listening Passage Preview/ Phrase Drill condition was 83 CWPM. This
new score was also 30% or higher than the previous trial’s score of 35 CWPM. Therefore, the
Listening Passage Preview/ Phrase Drill condition was chosen because this condition was found
to be the most helpful, least intrusive intervention (see Figure 15).
Figure 9. April’s brief assessment and Problem Analysis results. Data points across the bottom indicate errors per minute.

Figure 10. April’s Treatment Evaluation/Tutoring results. Data points represent the median general reading score for one week.
Figure 11. Katie’s brief assessment and Problem Analysis results. Data points across the bottom indicate errors per minute.

Figure 12. Katie’s Treatment Evaluation/Tutoring results. Data points represent the median general reading score for one week.
Figure 13. Tammy’s brief assessment and Problem Analysis results. Data points across the bottom indicate errors per minute.

Figure 14. Tammy’s Treatment Evaluation/Tutoring results. Data points represent the median general reading score for one week.
Figure 15. Tim’s brief assessment and Problem Analysis results. Data points across the bottom indicate errors per minute.

Figure 16. Tim’s Treatment Evaluation/Tutoring results. Data points represent the median general reading score for one week.
Figure 17. Kristen’s brief assessment and Problem Analysis results. Data points across the bottom indicate errors per minute.

Figure 18. Kristen’s Treatment Evaluation/Tutoring results. Data points represent the median general reading score for one week. Numbers next to data points indicate tutoring sessions actually completed each week (Kristen was absent during one of the scheduled tutoring sessions on weeks that show only one session completed).
Kristen’s baseline score was 88 CWPM with two errors. Through the brief analysis process, the Incentive condition was found to be the least intrusive intervention that increased her oral reading fluency score to 30% or higher above her baseline score (110 CWPM). When a mini-withdrawal (reversal) was completed, Kristen’s new oral reading fluency score in the Incentive condition was 85 CWPM. This new score was also 30% or higher than the previous trial’s score of 63 CWPM. Therefore, the Incentive condition was chosen because this condition was found to be the most helpful, least intrusive intervention (see Figure 17).

Treatment Strength Phase

The most effective intervention strategy for each child was implemented for several sessions in the treatment strength phase until the effects of the chosen intervention were stabilized (data points were within a 20% range of each other). Results for all six students are shown in Table 5. Individual student results were as follows:

Table 5
Results of Treatment Strength Phase for all Students

<table>
<thead>
<tr>
<th>Student</th>
<th>Intervention found to be most effective after reversal</th>
<th>Does median of last three stabilized data points fall below the goal line?</th>
<th>New Intervention Package</th>
<th>Does median of last three stabilized data points fall below the goal line?</th>
<th>Intervention Package chosen for Treatment Evaluation Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>RR</td>
<td>Yes</td>
<td>IN + RR</td>
<td>No</td>
<td>IN + RR</td>
</tr>
<tr>
<td>April</td>
<td>RR</td>
<td>Yes</td>
<td>IN + RR</td>
<td>Yes</td>
<td>IN + RR + PD</td>
</tr>
<tr>
<td>Katie</td>
<td>PD</td>
<td>No</td>
<td>-----------------------</td>
<td>-------</td>
<td>PD</td>
</tr>
<tr>
<td>Tammy</td>
<td>PD</td>
<td>Yes</td>
<td>IN + PD</td>
<td>Yes</td>
<td>IN + RR + PD</td>
</tr>
<tr>
<td>Tim</td>
<td>PD</td>
<td>Yes</td>
<td>IN + PD</td>
<td>Yes</td>
<td>IN + RR + PD</td>
</tr>
<tr>
<td>Kristen</td>
<td>IN</td>
<td>Yes</td>
<td>IN + RR</td>
<td>No</td>
<td>IN + RR</td>
</tr>
</tbody>
</table>

Note. IN = Incentive, RR = Repeated Reading, PD = Listening Passage Preview/Phrase Drill, and EM = Easier Material

When Amy’s chosen intervention of Repeated Reading was implemented for three sessions in the problem analysis phase, the median of these three sessions did not fall at or above the goal line of 100 CWPM. This indicated that the Repeated Reading intervention alone was not
enough to improve Amy’s score. Consequently, the Repeated Reading intervention was combined with the Incentive intervention (RR + IN) to create an intervention package. The Incentive intervention was chosen because it was the least intrusive of the three intervention choices that were left. When this new intervention package was administered over five sessions, it was found to be the most successful, least intrusive package for improving Amy’s oral reading fluency score to at least 100 CWPM (see Figure 7).

When April’s chosen intervention of Repeated Reading was implemented for six sessions in the problem analysis phase, the median of the last three data points (last three passages read) fell below the goal line of 100 CWPM. This indicated that the Repeated Reading intervention alone was not enough to improve April’s score. Consequently, the Repeated Reading intervention was combined with the Incentive intervention (RR + IN) to create an intervention package. When this new intervention package was administered over four sessions, the median of the last three data points still fell below the goal line of 100 CWPM. Therefore, Listening Passage Preview/Phrase Drill (PD) was combined with the Incentive + Repeated Reading conditions to create an even more intensive treatment package (IN + RR + PD). When this new intervention package was administered over three sessions, it was found to be the most successful package for improving April’s oral reading fluency score to at least 100 CWPM (see Figure 9).

When Katie’s chosen intervention of Listening Passage Preview/Phrase Drill was implemented for three sessions in the problem analysis phase, the median of the last three data points (last three passages read) fell above the goal line of 100 CWPM. This indicated that Listening Passage Preview/Phrase Drill (PD) was the most successful package for improving Katie’s oral reading fluency score to at least 100 CWPM (see Figure 11).

When Tammy’s chosen intervention of Listening Passage Preview/Phrase Drill was implemented for six sessions in the problem analysis phase, the median of the last three data points (last three passages read) fell below the goal line of 100 CWPM. This indicated that the Listening Passage Preview/Phrase Drill (PD) intervention alone was not enough to improve Tammy’s score. Consequently, the Listening Passage Preview/Phrase Drill (PD) intervention was combined with the Incentive intervention (PD + IN) to create an intervention package. When this new intervention package was administered over four sessions, the median of the last three data points still fell below the goal line of 100 CWPM. Therefore, the Repeated Reading
condition was combined with the Listening Passage Preview/Phrase Drill + Incentive conditions to create an even more intensive treatment package (IN + RR + PD). When this new intervention package was administered over five sessions, it was found to be the most successful intervention package for improving Tammy’s oral reading fluency score to at least 100 CWPM (see Figure 13).

When Tim’s chosen intervention of Listening Passage Preview/Phrase Drill was implemented for three sessions in the problem analysis phase, the median of these three data points fell below the goal line of 100 CWPM. This indicated that the Listening Passage Preview/Phrase Drill (PD) intervention alone was not enough to improve Tim’s score. Consequently, the Incentive intervention (IN) was combined with the Listening Passage Preview/Phrase Drill (PD) intervention (PD + IN) to create an intervention package. When this new intervention package was administered over seven sessions, the median of the last three data points still fell below the goal line of 100 CWPM. Therefore, Repeated Reading was combined with the Listening Passage Preview/Phrase Drill + Incentive conditions to create an even more intensive treatment package (IN + RR + PD). When this new intervention package was administered over four sessions, it was found to be the most successful package for improving Tim’s oral reading fluency score to at least 100 CWPM (see Figure 15).

When Kristen’s chosen intervention of Incentive was implemented for five sessions in the problem analysis phase, the median of the last three data points fell below the goal line of 100 CWPM. This indicated that the Incentive intervention alone was not enough to improve Kristen’s score. Consequently, the Incentive intervention (IN) was combined with the Repeated Reading intervention (RR) to create an intervention package (IN + RR). The Repeated Reading condition was chosen because it was the least intrusive of the three remaining intervention choices. When this new intervention package was administered over five sessions, it was found to be the most successful, least intrusive package for improving Kristen’s oral reading fluency score to at least 100 CWPM (see Figure 17).

**Treatment Evaluation Phase**

Results were that for five of the six students, oral reading fluency scores increased significantly as a result of the Brief Assessment and tutoring when the appropriate intervention package was found and implemented over time. See results in Table 6.
Table 6
Results of Treatment Evaluation Phase for all Students

<table>
<thead>
<tr>
<th>Student</th>
<th>Finishing Tutoring Package</th>
<th># of weeks tutored</th>
<th>Median Baseline Score</th>
<th>Ending Score</th>
<th>CWPM increase from Median Baseline Score to End Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>• IN + RR</td>
<td>15</td>
<td>59</td>
<td>82</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>• Pizza Incentive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2x’s per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>• IN + RR + PD</td>
<td>9</td>
<td>40</td>
<td>58</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>• Pizza Incentive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2x’s per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Katie</td>
<td>• PD</td>
<td>8</td>
<td>80</td>
<td>88</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>• Pizza Incentive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2x’s per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tammy</td>
<td>• IN + RR + PD</td>
<td>13</td>
<td>62</td>
<td>92</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>• Pizza Incentive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Increased to 3x’s per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tim</td>
<td>• IN + RR + PD</td>
<td>10</td>
<td>44</td>
<td>58</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>• Pizza Incentive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2x’s per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kristen</td>
<td>• IN + RR + PD</td>
<td>9</td>
<td>88</td>
<td>85</td>
<td>-3</td>
</tr>
<tr>
<td></td>
<td>• Pizza Incentive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 2x’s per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. IN = Incentive, RR = Repeated Reading, PD = Listening Passage Preview/Phrase Drill, and EM = Easier Material

For Kristen, the one student whose oral reading fluency scores did not increase, an inconsistency in school attendance was thought to be the crucial factor in her lack of progress (see paragraph on Kristen below). Although almost all students’ oral reading fluency scores increased, none of the students were able to receive tutoring services for the sixteen-week period that was originally planned. This was due to Fairfield South Elementary School procedures and difficulties with graduate students’ (tutors) scheduling. As a result, the number of tutoring sessions varied from child to child and students’ individual scores were based on number of tutoring sessions that occurred for each individual student.
Results for individual students were as follows:

For Amy, intervention sessions were increased to twice per week and Amy’s aim line was drawn to reflect a goal of 80 correct words per minute by 5/3/04. Amy’s intervention
package of RR+IN was successfully implemented over a period of 15 weeks. Amy received a pizza coupon each time her general reading score fell above her aim line. Amy’s oral reading fluency scores closely followed the aim line, with no three consecutive scores falling below the aim line at any time throughout the process. At the end of the 15-week period, Amy’s ending oral reading fluency score was 82; two points higher than her oral reading fluency goal of 80 correct words per minute (see Figure 8).

For April, intervention sessions were increased to twice per week and April’s aim line was drawn to reflect a goal of 64 CWPM (correct words per minute) by 6/14/04. April’s intervention package of RR+IN + PD was successfully implemented over a period of 9 weeks. April received a pizza coupon each time her general reading score fell above her aim line. April’s oral reading fluency scores closely followed the aim line, with no three consecutive scores falling below the aim line at any time throughout the process. At the end of the 9-week period, April’s ending oral reading fluency score was 58 CWPM. This score fell above her aim line and was an increase of 18 CWPM from her baseline score (40 CWPM). Based on visual analysis of her graphed results, if April had continued to be tutored for 16 weeks instead of 9 weeks, it is very likely that she would have reached her oral reading fluency goal of 64 CWPM (see Figure 10).

For Katie, intervention sessions were increased to twice per week and Katie’s aim line was drawn to reflect a goal of 91 CWPM by 6/28/04. Katie’s intervention package of PD was successfully implemented over a period of 8 weeks. Katie received a pizza coupon each time her general reading score fell above her aim line. Her oral reading fluency scores closely followed the aim line, with no three consecutive scores falling below the aim line at any time throughout the process. At the end of the 8-week period, Katie’s ending oral reading fluency score was 88 CWPM. This score fell along her aim line and was an increase of 8 CWPM from her baseline score (80 CWPM). Based on visual analysis of her graphed results, if Katie had continued to be tutored for 16 weeks instead of 8 weeks, it is very likely that she would have reached her oral reading fluency goal of 91 CWPM (see Figure 12).

For Tammy, intervention sessions were increased to twice per week and Tammy’s aim line was drawn to reflect a goal of 89 CWPM by 5/21/04. Tammy’s intervention package of IN + RR + PD was successfully implemented over a period of 13 weeks. Tammy received a pizza coupon each time her general reading score fell above her aim line. Tammy’s oral reading
fluency scores closely followed the aim line at times, but on two separate occasions throughout the process, three consecutive scores fell below the aim line. As a result, Tammy’s intervention package was intensified even further; tutoring sessions were increased from twice per week to three times per week. When this new intervention package was administered over five weeks, it was found to be the most successful, least intrusive package for improving Tammy’s general oral reading fluency score to follow her aim line (there were no occasions when three consecutive data points fell below the aim line). At the end of the 13-week period, Tammy’s ending oral reading fluency score was 92 CWPM; three points higher than her oral reading fluency goal of 89 CWPM. In addition, her errors had decreased from 16 (baseline) to below 7 errors per passage (see Figure 14).

For Tim, intervention sessions were increased to twice per week and Tim’s aim line was drawn to reflect a goal of 69 CWPM by 6/14/04. Tim’s intervention package of RR+IN + PD was successfully implemented over a period of 10 weeks. Tim received a pizza coupon each time his general reading score fell above his aim line. Tim’s oral reading fluency scores closely followed the aim line, with no three consecutive scores falling below the aim line at any time throughout the process. At the end of the 10-week period, Tim’s ending oral reading fluency score was 58 CWPM. This score fell above his aim line and was an increase of 14 CWPM from his baseline score (44 CWPM). Based on visual analysis of his graphed results, if Tim had continued to be tutored for 16 weeks instead of 10 weeks, it is very likely that he would have reached his oral reading fluency goal of 69 CWPM (see Figure 16).

For Kristen, intervention sessions were increased to twice per week and Kristen’s aim line was drawn to reflect a goal of 110 CWPM by 6/21/04. Kristen’s intervention package of IN + RR was implemented over a period of nine weeks. Kristen received a pizza coupon each time her general reading score fell above her aim line. Kristen’s oral reading fluency scores closely followed the aim line for the first three weeks, but throughout the continuing weeks, her scores continued to fall consecutively below her aim line. As a result, Kristen’s intervention package would have been intensified even further, however, Kristen was often absent from school and was not consistently receiving the two tutoring sessions per week that was part of her intervention package. During the second, third, fifth, sixth, and seventh weeks of tutoring, Kristen was only at school during one of the two scheduled tutoring sessions (days) per week (see Figure 18). Therefore, it was unknown whether her falling oral reading fluency scores were
a result of missed sessions or whether her intervention package needed to be further intensified. It was decided that her intervention package would remain the same until consistent attendance was achieved and results with the current intervention package could be seen. Unfortunately before week nine (the last week), attendance for this student had not improved and Kristen’s scores had fallen to as low as 13 CWPM below her median baseline score. Because it was unsure as to whether Kristen’s attendance would ever improve, it was decided that the additional intervention of Listening Passage Preview/ Phrase Drill (PD) would be added to her current package of Incentive + Repeated Reading (IN + RR) to form a new, more intense intervention package (IN + RR + PD). When this new intervention package was administered for the remaining week (week nine), it was found to slightly increase Kristen’s oral reading fluency score by 10 CWPM from the week before (75 CWPM); however, this score (85 CWPM) was still three CWPM below her baseline median score (88 CWPM). (see Figure 18). To see the true effects of Kristen’s intervention package (IN + RR) or her new intensified intervention package (IN + RR + PD) on Kristen’s oral reading fluency, additional time and sessions would have been needed.

Growth rates for all students are reported in Table 7. Growth rate scores for Winter 02-Spring 03 and for Spring 03- Fall 04 were not available for the fourth-grade student, Kristen. This is because CBM oral reading fluency scores were not assessed for Kristen in a school she had recently transferred from. Growth between CBM oral reading fluency scores were examined before and during the time that the tutoring sessions were implemented. Results show that the oral reading fluency growth rate for five of the six students improved significantly from before treatment implementation to the end of treatment implementation. In addition, between Winter 2003- Spring 2004 all five third-grade students’ average growth rates were higher than their peers’ average growth rate of +.91. Their peers consisted of all other 3rd grade students at Fairfield South Elementary School. Four out of five of the third-grade students’ growth rates also exceeded the average growth rate (+1.39) that has been found by the literature to indicate a highly effective intervention for students receiving special education services (Deno et al., 2001). Although none of these four third-grade students were receiving special education services at the time of this study, all four students’ oral reading fluency rates improved at a rate that was commensurate with a student receiving highly effective special education services. Though the remaining third-grader, Katie, made significant progress and had an average growth rate that was
Table 7
Oral reading fluency Growth Rate Before and During Treatment vs. Peers and Effective Special Education Standards

<table>
<thead>
<tr>
<th>Name</th>
<th>Winter 02-Spring 03 (15 weeks)</th>
<th>Spring 03-Fall 03 (22 weeks)</th>
<th>Fall 03-Winter 03 (14 weeks)</th>
<th>Winter 03-Spring 0-4 (15 weeks)</th>
<th>Exceeded +.91? (Peers)</th>
<th>Exceeded +1.39? (Highly Effective)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy</td>
<td>-.36</td>
<td>+0</td>
<td>+1.57</td>
<td>+2.0</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>April</td>
<td>+0</td>
<td>+.32</td>
<td>+.57</td>
<td>+.93</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Katie</td>
<td>+1.14</td>
<td>-.54</td>
<td>-.07</td>
<td>+2.8</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Tammy</td>
<td>+.64</td>
<td>-.18</td>
<td>+.5</td>
<td>+1.53</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Tim</td>
<td>-.20</td>
<td>-.18</td>
<td>+1.14</td>
<td>+1.67</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Kristen</td>
<td>Score not available</td>
<td>Score not available</td>
<td>+1.57</td>
<td>+.4</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Note. Bold indicates the growth rate occurred during the treatment/tutoring period.

higher than her peers’ average growth rate of +.91, she was the only third-grader who did not have a growth rate that exceeded the average growth rate that has been found by the literature to indicate a highly effective intervention for students receiving special education services (her average growth rate was +.93). Kristen, the fourth grade student, did not have a growth rate that was higher than her peers’ average growth rate, nor did her growth rate exceed the average growth rate found by the literature to indicate a highly effective intervention for students receiving special education services. It is hypothesized that Kristen’s lack of progress was due to her frequent absences from school.

Discussion

Answers to Research Questions

This is the first known study to be done that attempts to combine the Problem Validation Screening process with the Brief Assessment model using the same student data sets of elementary aged-students referred for reading problems. The results of this study showed that combining the Problem Validation Screening process with the Brief Assessment was an overall success; all six participants in the study were accurately identified as at-risk for reading problems.
through the Problem Validation Screening process and five of the six participants’ scores improved significantly through the Brief Assessment/tutoring procedure.

To address the research questions initially asked: “Do the results of the brief assessment/tutoring process in this study appear to validate referral concerns found through the Problem Validation Screening Process?” The answer is “yes.” Brief Assessment results for all six participants of the study corresponded with results found through the teacher interview data, CBM oral reading fluency screening process, and classroom observation. Like the Brief Assessment results, teacher interview results found all six students to be either “Below grade level” or “Well below grade level” (see Table 1). In addition, CBM oral reading fluency scores for all six students corresponded with the teacher interview data and the brief assessment results in that all six students’ initial scores were found to be significantly lower than their classroom peers’ (see Figures 1-6). Last, measures from a classroom observation corresponded with Brief Assessment/tutoring results for all six students as well. Five of the six students did not differ significantly from their peers in on-task behavior in the classroom, indicating an oral reading fluency skill problem. Amy was the only student in which a significant difference was found between her on-task behavior and the on-task behavior of her classroom peers. If a student has a performance deficit, it makes sense that a smaller intervention package that contains the Incentive condition will be the most effective for improving his or her oral reading fluency. Not surprisingly then, Amy was the only student in which an intervention package of only two conditions (IN + RR), in which one of the conditions was Incentive, was enough to significantly improve her reading results. Similarly, the other five students required either more intensive intervention packages, or an intervention other than the Incentive intervention in order to significantly improve their reading skills (see Table 7). Because data from the Problem Validation Screening process validates data found through the Brief Assessment, this study supports that these two procedures are accurate methods for identifying at-risk students. These data also support results of other studies that have found the Problem Validation Screening process or the Brief Assessment Model to be more accurate methods than traditional referral processes for identifying students with reading problems (Daly et al., 1997; VanDerHeyden, et al., 2003; VanDerHeyden, Witt, & Naquin, 2003; VanDerHeyden & Witt, unpublished manuscript; Witt, 2001). Like these previous studies, the Problem Validation Screening process or Brief Assessment model was able to quickly identify students with reading problems while
greatly reducing the opportunity for referral bias. Even though the opportunity for referral bias was reduced, referral bias would not have been a problem with this study team anyway; staff screening referrals made for participants of this study were very accurate.

The second research question asks, “Can Problem Validation Screening and the Brief Assessment model be used as a way to link problem identification, problem analysis, and problem evaluation?” Based on the results of this study, the answer is “yes.” This study strongly supports that combining these two methods can accurately and efficiently link problem identification, problem analysis, and problem evaluation. The strong correspondence between the study’s problem identification results for the Problem Validation Screening process and the Brief Assessment Process (i.e., identification of low reading scores) indicates a strong link between the two methods. This link is further strengthened after problem identification by the improved oral reading fluency results of the brief assessment for five of the six participants (see Tables 6 and 7). When the Problem Validation Screening process and the Brief Assessment model were combined in this study then, a methodical objective procedure resulted that allowed us to quickly and accurately identify participants at-risk for reading problems. Next, it allowed us to find an intervention that directly linked the problem with a empirically-based research package, and then to implement and change this intervention package based on the on-going progress monitoring of student results. This procedure was sensitive to short-term progress, fair, and individualized. Linking the Problem Validation Screening Process with the Brief Assessment model also may allow for an accurate hypothesis to be made for why a student’s scores are not improving when due to an extraneous variable. For the fourth-grade student, Kristen, she was able to be accurately identified as having a reading problem through teacher observation and CBM oral reading fluency scores. The possibility that she had a performance deficit was then able to be determined improbable, based on results from the classroom observation. Last, based on careful tracking of data, the Brief Assessment Model/tutoring process showed that an individualized intervention package had the capability to increase Kristen’s scores. However, it also showed that her school absences were frequent, most likely hindering this process (see Figure 18).

To address the third research question, “What are the long-term effects of reading fluency using the Brief Assessment model?” results show that the long-term effects were significant for five of the six students in the study. When the Brief Assessment was implemented over an extended period of time, outcomes were very similar to effects produced when the process was
implemented over a period of several weeks. Students’ scores continued to improve over time, though it was sometimes necessary to modify the intervention package, even during the problem evaluation (tutoring) stage, in order for it to continue to meet individual students’ needs. However, with the extended analysis that this study provided, five of the six student participants were ultimately able to increase their oral reading fluency level at an expected growth rate for their grade level (+1 CWPM/week) (Fuchs et al., 1993). In addition, the growth rate for five of the six students surpassed the average growth rate of their classroom peers (see Table 7). These results are similar to brief assessment results found by previous studies (Daly et al., 1998; Daly et al., 1999; Jones & Wickstrom, 2002; Jones et al., 2001; Noell et al., 2001). These results also provide much needed empirical support (Daly et al., 1998; Eckert et al., 2000; Jones et al., 2001) in the areas of generalized learning effects of brief assessment and extended analysis to assess long-term treatment effects.

**Limitations of Study**

Limitations of this study were that first of all, reading was the only academic area that was addressed. The Problem Validation Screening process combined with the Brief Assessment model has the potential to be helpful in other academic subjects such as math or writing.

A second limitation was that classroom observations were completed only once for each child. Though observation results were commensurate with Brief Assessment/tutoring results at the end of the study, one or two more observation sessions for each child may have provided a more accurate measure of their average on-task behavior.

A third limitation was that this study was only completed with five third-grade students and one fourth-grade student from a suburban school district. In addition, five of the six children were Caucasian and only one was African-American. The study therefore did not address students of other age groups, of other races, of other academic levels, or that attended urban or rural school districts.

A fourth limitation was that the Brief Assessment model/tutoring process was not able to be implemented over the 16-week period for each child as was originally intended. If this tutoring process had been extended over a longer period of time, further longitudinal outcomes might have been established that could have strengthened intervention results.
A fifth limitation was that for one student, Kristen, decisions made for her intervention package during the Treatment Evaluation Phase were also not made according to protocol due to the unexpected situation involving the student’s frequent absences from school.

Future Research

With respect to the above limitations, one area of future research could provide valuable information for how beneficial combining the Problem Validation Screening process with the Brief Assessment model could be for other academic areas besides reading. These combined methods have the potential to be very helpful in other areas such as math or writing as well.

Another limitation that could be addressed in future research is that this study could be replicated with a more diverse range of participants, including other age groups, students of other socioeconomic statuses or races, students of other academic levels, or those that attend urban or rural schools.

A third possible area for future research is that this study could be replicated using an extended analysis that lasts over an even longer period of time. This could be done to see what the cumulative effects are on student academic performance over years or even decades. To have these study results would further strengthen the empirical support for combining Problem Validation Screening with the Brief Assessment process.

A final area for future research might be to use information gathered for a student through the Problem Validation Screening process combined with the Brief Assessment model as measurement data for the use of eligibility determination. Many states, including the state of Ohio, recently adopted the empirically based practice of using Response to Intervention (RTI) as a promising alternative to previous models for determining if a child is eligible for special education services (Gresham, unpublished manuscript; VanDerHeyden & Witt, unpublished manuscript). Ohio’s operating standards maintain that it is necessary to provide interventions to resolve concerns for children prior to conducting a full and individual evaluation for special education eligibility determination and that it is necessary to use data from interventions to determine eligibility for special education services (Operating Standards for Ohio’s Schools Serving Children with Disabilities, 2002). RTI follows these guidelines in that it is designed to determine through intervention services which children need what services delivered and with how much intensity (VanDerHeyden & Witt, unpublished manuscript). Research indicates that the average amount of extra, intensive instructional time that is spent with a student receiving
special education services is 80 minutes per week (Swanson & Hoskyn, 1999). The Problem Validation Screening process combined with the Brief Assessment is one way of implementing an RTI model; it is one way for accurately determining how much extra instructional time is being spent with a student and the intensity of the services being provided.

Although the Problem Validation Screening process combined with the Brief Assessment model has the potential to provide valuable information about a process that could someday be adopted as a best practices method for determining special education eligibility, future research needs to be conducted to validate these research findings. This study as well as others that address limitations of this study should be replicated before a school can adopt this method through a research-based decision-making process.
References


Appendix A

ACADEMIC TUTORING PROGRAM
Miami University School Psychology Program
Educational Psychology Department (513) 529-6621

PARENT/GUARDIAN CONSENT FORM

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 several months, your child will be provided individualized tutoring that is matched to his or 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: Four types of strategies will be used as part of this 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 reading skills. We will carefully assess which of these is the most effective in increasing oral reading skills. All 30-minute reading 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 determine learning strengths and evaluate outcomes. 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, may 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 an 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 do decide to withdrawal from the study, your child will continue to receive reading services from his or her reading teacher in the regular classroom or reading center. If you have any questions or concerns, or would like more information about the program, please contact your child’s teacher and/or the research team at Miami University:
Dr. Katherine Wickstrom, 513-529-6624 Amity Noltemeyer, M.S., 513-529-8069
Shelaina Brown, M.S., 513-529-8051 Jeffery Schuka, M.S., 513-529-8051

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

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>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 or 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>
</tbody>
</table>
23. The intervention produced enough improvement in the child’s reading that it is no longer a concern

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>

24. Other concerns related to reading are likely to be improved by this intervention

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>

Comments:___________________________________________________________________________________
__________________________________________________________________________________________
Appendix C
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>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest 10%</td>
</tr>
<tr>
<td>Lower 20- 30%</td>
</tr>
<tr>
<td>Middle 40%</td>
</tr>
<tr>
<td>Upper 20%-30%</td>
</tr>
<tr>
<td>Highest 10%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Below Grade</td>
</tr>
<tr>
<td>Below Grade</td>
</tr>
<tr>
<td>At Grade Level</td>
</tr>
<tr>
<td>Above Grade</td>
</tr>
<tr>
<td>Well Above Grade</td>
</tr>
</tbody>
</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>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest 10%</td>
</tr>
<tr>
<td>Lower 20- 30%</td>
</tr>
<tr>
<td>Middle 40%</td>
</tr>
<tr>
<td>Upper 20%-30%</td>
</tr>
<tr>
<td>Highest 10%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Below Grade</td>
</tr>
<tr>
<td>Below Grade</td>
</tr>
<tr>
<td>At Grade Level</td>
</tr>
<tr>
<td>Above Grade</td>
</tr>
<tr>
<td>Well Above Grade</td>
</tr>
</tbody>
</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>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest 10%</td>
</tr>
<tr>
<td>Lower 20- 30%</td>
</tr>
<tr>
<td>Middle 40%</td>
</tr>
<tr>
<td>Upper 20%-30%</td>
</tr>
<tr>
<td>Highest 10%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Below Grade</td>
</tr>
<tr>
<td>Below Grade</td>
</tr>
<tr>
<td>At Grade Level</td>
</tr>
<tr>
<td>Above Grade</td>
</tr>
<tr>
<td>Well Above Grade</td>
</tr>
</tbody>
</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>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest 10%</td>
</tr>
<tr>
<td>Lower 20- 30%</td>
</tr>
<tr>
<td>Middle 40%</td>
</tr>
<tr>
<td>Upper 20%-30%</td>
</tr>
<tr>
<td>Highest 10%</td>
</tr>
</tbody>
</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>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest 10%</td>
</tr>
<tr>
<td>Lower 20- 30%</td>
</tr>
<tr>
<td>Middle 40%</td>
</tr>
<tr>
<td>Upper 20%-30%</td>
</tr>
<tr>
<td>Highest 10%</td>
</tr>
</tbody>
</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>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest 10%</td>
</tr>
<tr>
<td>Lower 20- 30%</td>
</tr>
<tr>
<td>Middle 40%</td>
</tr>
<tr>
<td>Upper 20%-30%</td>
</tr>
<tr>
<td>Highest 10%</td>
</tr>
</tbody>
</table>
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 D

Phase II: Problem Analysis

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, say “stop” and put a slash (/) after the last word.

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.
3. “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 1.3 (goal is to increase by 30%). For example, if baseline median was 21, goal is 27.

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 or her them at approximately 30% 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 30% 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 or 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 or her at approximately 30% 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 or her at approximately 30% past BL (_____CWPM).

4. Score errors and correct words per minute. Complete fidelity checklist.
Appendix E

Fidelity Checklist for

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

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 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 + 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 < 7errors

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 < 7errors

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

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