ABSTRACT

THE BRIEF ASSESSMENT MODEL FOR ORAL READING FLUENCY:
EXAMINING SOCIAL VALIDITY ISSUES

By Amity Noltemeyer

The brief assessment model is a method of linking assessment to intervention for students experiencing reading difficulties. Specifically, this model involves briefly comparing four research-based reading interventions in order to determine which intervention or combination of interventions will produce the greatest improvement in reading fluency for a student. In this study, the process and social validity of the brief assessment model was examined. Five third grade students with oral reading fluency difficulties went through the brief assessment and an effective treatment package was identified for all students. Each student was tutored using his or her treatment package for approximately 16 weeks. The effectiveness of the treatment was evaluated based on growth in oral reading fluency during treatment sessions over the 16-week period, as well as socially valid measures such as teacher acceptability/perceived effectiveness and generalization of treatment effects to school-wide CBM benchmarking and the Ohio Third Grade Reading Achievement Test.
THE BRIEF ASSESSMENT MODEL FOR ORAL READING FLUENCY:
EXAMINING SOCIAL VALIDITY ISSUES

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Introduction

Research has indicated that school psychologists spend approximately 50% of their time engaged in assessment activities (Bramlett, Murphy, Johnson, Wallingsford, & Hall, 2002; Hutton, Dubes, & Muir, 1992). Specifically, reading difficulties are the most common referral for assessment, accounting for 57% of school psychologists’ total referrals (Bramlett et al., 2002). Given the amount of time and resources school psychologists dedicate to the assessment of reading difficulties, one would assume that these assessment activities would lead to improved reading outcomes for students. However, research has demonstrated that the traditional assessment models typically employed by school psychologists do not lead to noticeably improved outcomes (e.g., Gresham & Witt, 1997).

Historically speaking, assessment for reading difficulties has been characterized by a test-and-place model. Using this model, when a student was referred to the school psychologist for reading difficulty, the school psychologist would administer a battery of costly and time-consuming norm-referenced tests. If a significant discrepancy between the referred student’s scores on tests of cognitive ability and tests of achievement was discovered, then the student would be identified as a student with a learning disability and would be provided special education services. However, although using a test-and-place model results in classification and placement decisions, it does not result in instructional decisions regarding the student’s individualized reading needs (Gresham & Witt, 1997).

Today, the field of school psychology has come to the realization that the test-and-place model is grossly ineffective. First of all, norm-referenced tests do not directly assess what is taught in the student’s curriculum, leading to poor teach-test overlap (Shapiro, 1996). In addition, norm-referenced tests cannot be used for ongoing progress monitoring, as they are time consuming and are not sensitive to small changes in student performance (Shapiro, 1996). Finally, and perhaps most importantly, the results from norm-referenced tests do not lead to meaningful interventions for students (Shapiro, 1996). This drawback is one of the primary reasons that traditional assessment models are viewed as unacceptable by many teachers and school psychologists (Gresham & Witt,
 Teachers and school psychologists are realizing a need for direct assessment methods that provide a link between individualized assessment and intervention. One of the most promising new tools for meeting this need is the brief assessment model. In the following sections, the history, pioneering research, and characteristics of this model will be explored.

**Historical Roots of the Brief Assessment Model**

The brief assessment model grew out of the research on functional analysis. Functional analysis (a.k.a., experimental analysis) involves systematically manipulating an independent variable (e.g., a treatment strategy) while observing the effects of this manipulation on a particular behavior (Martens, Eckert, Bradley, & Ardoin, 1999). The goal of functional analysis is to understand why a target behavior occurs and which intervention(s) will be most successful in altering it (Martens et al., 1999).

Iwata, Dorsey, Slifer, Bauman, and Richmond (1982) pioneered the research on functional analysis methods in the domain of self-injurious behavior. In this study, nine participants were exposed to a series of brief conditions that assessed various hypotheses for what factors might be maintaining self-injurious behavior. The conditions varied along the following dimensions: presence or absence of attention, play materials, or task demands. The results of this study suggested that functional analysis is useful in identifying factors that may maintain self-injurious behavior as well as for designing effective interventions to eliminate these maintaining factors. For example, if it was determined that attention from the experimenter to the self-injurious behaviors maintained those behaviors, then the intervention might consist of providing attention when the participant was not engaging in self-injurious behavior.

Although many subsequent researchers successfully applied functional analysis techniques to behavior problems (e.g., Mace, Yankanich, & West, 1988; Broussard & Northrup, 1995), the research applying functional analysis to academic problems did not appear until over a decade after Iwata et al.’s (1982) original study (e.g., Daly, Witt, Martens, & Dool, 1997). Originally, functional analysis was overlooked as applicable in the schools due to the amount of time and resources necessary for its implementation. However, the advent of brief functional analysis, which requires significantly less time
and resources, made these procedures more efficient and applicable in schools and opened the door for research in the domain (Daly & Murdoch, 2000).

For the duration of this paper, the brief functional analysis of academic problems will be referred to as the brief assessment model. The brief assessment model is a set of procedures for comparing a number of treatment conditions over a short period of time in order to design individually-tailored interventions (Eckert, Ardoin, Daisy, & Scarola, 2000). Curriculum-Based Measurement (CBM) serves as a foundation of the brief assessment model by providing the mechanism through which data are collected and progress is monitored. CBM is a method for indexing growth and progress in basic academic skills that involves administering brief, frequent, and repeated skill probes developed from the child’s curriculum (Shapiro, 1996; Elliott & Fuchs, 1997). CBM has been demonstrated to be a reliable and valid indicator of academic achievement (Shapiro, 1996; Elliott & Fuchs, 1997).

Model for Brief Assessment

Daly et al. (1997) pioneered the model for the brief assessment of academic skills. In this seminal article, Daly et al. proposed five hypotheses for why students fail at academic tasks, specifically reading tasks. In addition, based on previous reading intervention research, Daly et al. proposed treatment conditions to test each hypothesis. These hypotheses, along with the treatment conditions used to test them, have served as the backbone of all subsequent brief assessment research.

The first hypothesis proposed by Daly et al. (1997) is that the student does not want to do the academic task. In other words, the student is experiencing a performance deficit as opposed to a skill deficit- he or she knows how to perform a skill but does not have the motivation to do it. This hypothesis can be tested by providing rewards for increased performance. Research has demonstrated that providing incentives for reading has been effective in increasing students’ motivation and overall academic performance (e.g., Ayllon & Roberts, 1974; Staats & Butterfield, 1964). If a student does not respond to incentives, it is assumed either the wrong incentives are being used or the student lacks the necessary skills to perform the task.
The second hypothesis proposed by Daly et al. (1997) is that the student has not spent enough time actively practicing the academic task. This hypothesis can be tested by increasing the rate of student responding through repeated exposure and practice with the task. For example, using a Repeated Reading strategy has been demonstrated to be effective in improving students’ oral reading fluency (e.g., Meyer & Felton, 1999). Repeated Reading involves having the student read the same passage three to four times in order to gain more practice and exposure to the text (Meyer & Felton, 1999).

The third hypothesis for academic failure is that the student has not received enough help with the academic task. In the area of reading, the student may need feedback on his or her reading in order to increase accuracy and speed. This hypothesis can be tested by increasing modeling and corrective feedback. Research has shown that when teachers provide corrective feedback to students, the likelihood of student success is increased (e.g., Rosenshine & Berliner, 1978). One strategy that allows for this is Listening Passage Preview/Phrase Drill. Using this strategy, the instructor first reads the passage aloud to the student. Then, the student reads the passage aloud while the instructor highlights the errors. Next, the student reads each highlighted word in the context of a phrase three times. Finally, the student reads the passage again (Rosenshine & Berliner, 1978).

The fourth hypothesis is that the student’s instructional activities do not promote mastery of the curricular skill. According to this hypothesis, the student may not be spending enough time engaged in the appropriate types of instructional activities needed to learn the curricular skill. This hypothesis can be tested by specifying the instructional objective and identifying activities that promote the use of this skill in the context that it is most often used.

The final hypothesis proposed by Daly et al. (1997) is that the academic material is too hard. In other words, the level of the instructional materials is beyond the student’s skill level. This hypothesis can be tested by changing instructional materials to better match the student’s skill level. Research by Gickling and Armstrong (1978) has indicated that students’ accuracy and on-task behavior can be improved by using instructional materials that match the students’ skill levels.
Daly et al. (1997) recommended exposing the student to brief treatment conditions in order to test each of the aforementioned hypotheses. The purpose of this process is to determine the least intrusive treatment that produces the biggest improvement in the academic task.

Principal Characteristics of the Brief Assessment Model

Before reviewing empirical research on the brief assessment model, it is important to provide a more clear description of the defining features of this model.

Design features. First, the brief assessment model uses abridged data series that may contain only one data point per treatment condition, as opposed to at least three data points per condition in extended functional analyses (Martens et al., 1999). The reason for the abridged data series is practicality: time is a commodity in schools, and collecting three data points per condition may not be feasible. Because only one data point is collected for each treatment condition, it is important that the testing environment be a controlled setting where the effects of extraneous variables can be minimized or eliminated (Martens et al., 1999). Some researchers have supplemented this brief analysis with a more extended analysis in order to confirm that the results obtained in the brief analysis are valid (e.g., Jones & Wickstrom, 2002; Jones, Harmon, & Wickstrom, 2001).

The brief assessment model is also unique in how treatment conditions are introduced. A pure multi-element design would involve repeatedly alternating treatment conditions in a random sequence over time (Alberto & Troutman, 2003). However, most brief assessment researchers have slightly modified this design. In this modified multi-element design, a baseline condition consisting of no treatment is presented first in order to gauge pre-treatment levels of functioning. Following the baseline condition, the treatment conditions are presented in order from least intrusive to most intrusive and each treatment condition is generally only presented one time. The rationale behind this order of presentation is that the time available for teachers to devote to classroom interventions is generally very limited; thus, it is important to identify the most effective intervention that uses the least amount of teacher resources in a brief amount of time.
Finally, the use of mini-withdrawals to establish a functional relationship is a critical component of the brief assessment model. In other words, after identifying a potentially effective treatment condition, the examiner must return either to baseline or to the last ineffective treatment, followed by the effective treatment (Martens et al., 1999). Without this replication, a functional relationship cannot be established; thus, the examiner would not know whether a change in performance in one condition was due to the effectiveness of that condition or to factors unrelated to that condition.

Characteristics of curriculum based measurement (CBM). Because CBM is a cornerstone of the brief assessment model, it is important to note some near-universal features of CBM. By “near-universal,” it is meant that these features were used in virtually every brief assessment study; however, some researchers chose to slightly modify these features. Thus, in the literature review to follow, it will only be noted if these features are modified in some way.

The reading probes used as a tool in the brief assessment model are generally selected from reading series (Shapiro, 1996). In addition, the two metrics used to discuss CBM reading performance are Correct Words Per Minute (CWPM) and Errors Per Minute (EPM). When administering CBM reading probes, the participant is asked to read a CBM reading passage aloud for 60 seconds while the examiner tracks errors (Shapiro, 1996). Although the rules for scoring CBM reading probes may be slightly different from study to study, it is generally assumed that the following rules apply: 1) omitting a word is counted as an error, 2) substituting an incorrect word for a correct word is counted as an error, 3) after a pause of three-seconds, the participant is told to “Go on” and the word is counted as an error, 4) adding a word is not counted as an error, 5) self-corrections and repetitions of words are not counted as errors, and 6) words pronounced with a dialect are not counted as errors (Shapiro, 1996). At the end of 60 seconds, CWPM is calculated as the number of errors subtracted from the total number of words.
Literature Review

_Brief Assessment Research_

Daly, Martens, Dool, & Hintze (1998) were the first researchers to empirically test the model proposed by Daly et al. (1997). The participants in this study were three students who were recommended by their teachers for oral reading intervention. The instructional reading passages used in this study were randomly selected from the _Silver, Burdett, & Ginn_ reading series. Each participant was presented the treatment conditions recommended by Daly et al. (1997) in individual sessions in order to identify the most effective treatment. In each session, the treatment was applied to the instructional passage and then participant performance was assessed during the final reading of the passage. The dependent variable in this study was the number of correctly read words per minute (CWPM) during the final readings in each treatment condition.

The treatment conditions were presented in a specified order from easiest to implement to most difficult to implement as follows: Baseline (no treatment applied), Incentive, Repeated Reading, Listening Passage Preview/Phrase Drill, and Easier Material. In addition, for participants who did not improve under these isolated conditions, combined conditions were used (e.g., for two students, Repeated Reading was combined with Listening Passage Preview/Phrase Drill). When a visible difference was found in a participant’s performance relative to baseline and other conditions, the researcher would return to baseline and then back to the effective condition, in a mini-replication. The goal of this process was to identify the least intrusive treatment that would lead to a noticeable improvement in reading.

Using this method, Daly et al. (1998) were able to isolate effective treatment conditions for each participant. For one participant, an isolated intervention condition was determined to be most beneficial; for the other two participants, combined intervention conditions were determined to be most effective.

Although effective treatment conditions were isolated for each participant, it is impossible to know if the results of the brief assessment would remain valid over time. Thus, a challenge posed to future researchers was to examine whether the results of an extended analysis would confirm the results of a brief analysis.
Several subsequent researchers, including Jones and Wickstrom (2002), examined this issue. Jones and Wickstrom used five participants in their research who were referred by their homeroom teacher for oral reading intervention. Instructional passages were derived from the *Ginn Reading* Series. The dependent variable was CWPM on these passages.

Each participant was exposed to 30-minute individual treatment sessions during which an examiner administered two or three of the treatment conditions. The treatment conditions were presented in the following order from the easiest to the most difficult to implement conditions: Baseline, Incentive, Repeated Reading, Phrase Drill, and Easier Material.

As previously mentioned, this study consisted of both a brief analysis and an extended analysis. During the brief analysis, CWPM on the instructional passage was used as the dependent variable. Each condition was presented once to each participant in the pre-determined order. Then, the researchers decided which condition produced the greatest results for each participant and conducted a mini-reversal to validate its effectiveness.

After a potential treatment condition was identified as effective through brief analysis, the extended analysis began. The purpose of the extended analysis was to see if the condition selected during the brief analysis continued to be effective and stable over time. During the extended analysis, meetings were held once or twice a week for an average of 28 days per participant. Each meeting consisted of alternating the selected condition with the baseline condition.

During the brief assessment, two participants responded best to the Phrase Drill condition, whereas three participants responded best to the Repeated Reading condition. In the extended analysis, it was found that the mean was higher for the selected condition for every participant. This evidence supports the stability of the condition chosen by the brief assessment. In addition, the results of this study supported previous findings that the most beneficial treatment for each participant can be isolated and confirmed. One limitation of this study was that not enough instructional passages were created, resulting in some participants being exposed to some or all of the passages twice during the
research. In addition, although the participants’ oral reading performance improved in this analogue setting, no data were collected to see whether or not the improvement carried over into the reading classroom. This limitation was addressed in the current study.

Jones et al. (2001) also examined the stability of extended analyses. Five students with reading difficulties participated in this study. The instructional passages were derived from the *Ginn Reading Series*.

In this study, the treatment conditions deviated slightly from those proposed by Daly et al. (1997). The treatment conditions used were: Baseline, Incentive, Passage Preview, and Easier Material. Passage Preview consisted of combining the Listening Passage Preview/Phrase Drill and Repeated Readings conditions so that the participant was receiving additional practice and error correction/modeling in the same condition.

The brief assessment took place over two days. A condition was determined to be effective in the brief assessment if it produced at least 40% growth over baseline and the results were replicated. The extended analysis followed the brief assessment and consisted of presenting Incentive, Passage Preview, and Easier Materials in a random sequence until a visual analysis indicated that the brief assessment results were either confirmed or clarified.

Results indicated that for two participants, the extended analysis validated the results of the brief analysis. For one participant, the condition chosen as effective in the brief assessment demonstrated only marginal effects during the extended analysis. For another participant, two conditions were identified as effective in the brief assessment, yet a third condition was more effective in the extended analysis. Finally, the most effective condition in the brief assessment for the last participant did not replicate, thus producing unclear results.

Noell, Freeland, Witt, and Gansle (2001) also studied the stability of brief assessment results over time. Participants in this study were four elementary school students who were referred for reading intervention. The materials used in this study differed from the previously described studies in that phonics skills and sight words were
assessed in addition to reading fluency. The materials were designed to assess three domains: letter sounds, sight words, and reading fluency.

The treatment conditions in this study were Baseline, Incentive, Listening Passage Preview/Phrase Drill, and Incentive + Listening Passage Preview/Phrase Drill. The brief assessments were conducted across the three levels of instructional materials for each of the four participants, resulting in a total of twelve brief assessments. A condition was determined to be effective if there was at least 20% growth over baseline. Based on this criterion, ten of the twelve brief assessments identified one or more of the conditions as effective. The extended analysis confirmed the results of the brief assessment in 10 out of the 12 instances. This suggests that brief assessment may be an accurate method of identifying effective reading interventions in a brief amount of time.

Unlike the previously mentioned studies, which focused primarily on evaluating isolated intervention conditions, Eckert et al. (2000) hypothesized that all students would obtain more benefits from combined treatment conditions than from isolated treatment conditions. The participants in this research were four students referred for reading fluency intervention. Similar to the previously described studies, reading passages were selected from the *Silver, Burdett, & Ginn* reading series. The research occurred over a 10-week period, during 15-minute sessions. Sessions were provided no more than four times per week with no more than two treatment conditions provided per day. The treatment conditions in this study consisted of baseline, skill-based intervention (SI), three performance-based interventions, and three combined skill-based and performance-based interventions.

The SI combined the Listening Passage Preview and Repeated Reading interventions traditionally used in brief assessment research. That is, the experimenter first read the passage aloud to the student, and then the student read the passage aloud three times. The results from this condition were based on CWPM during the first minute of the last reading of the text.

As mentioned, there were three performance-based interventions in this study. These three interventions were: goal setting plus performance feedback (PF), contingent reinforcement (CRf), and the combination of goal setting plus performance feedback and
contingent reinforcement (PF+CRf). The PF condition involved the student setting goals for how long it would take him or her to read the passage and how many errors he or she would have. Then, after reading the passage, the student would be told the time and the number of errors, and would be asked to record this information on a graph. The CRf condition was very similar to the traditional Incentive condition used in brief assessment research due to the fact that the student picked first and second choice awards and was given the first choice award if he or she met a certain goal and was given the second choice award if he or she met a less-challenging award. Finally, the PF+CRf condition combined the procedures of the PF and CRf conditions.

The three skill-based and performance-based intervention conditions were combinations of SI with each of the three performance-based interventions. Thus, they were SI+PF, SI+CRf, and SI+PF+CRf.

Results indicated that for three of the four participants, a combination of skill-based and performance-based interventions was associated with the greatest gains in oral reading fluency. The fourth participant demonstrated the greatest gains during the skill-based intervention, although moderate gains were also evident during the combination of skill-based and performance-based interventions. However, it is important to note that there are several limitations to this study. First and foremost, because an extended analysis was not conducted, it is unknown how reliable or stable the results from the brief analysis would be over time. In addition, generalized improvements in oral reading fluency were not observed over the course of the study. That is, although the participants’ CWPM may have increased on the passage in the treatment condition, their baseline CWPM increased only minimally over time indicating that the interventions may have had little to no effect on reading in other situations. This limitation was addressed by the current study.

Overall, the research on the brief assessment model thus far has focused predominately on technical issues related to the methodology and stability of the model itself. However, there are many aspects of the brief assessment model that remain relatively unexplored. At this point, it is necessary to examine the social validity of the brief assessment model, as it was a domain investigated in the current study.
Social Validity Research

One aspect of the brief assessment model that has been neglected in research literature is social validity. The term “social validity” was coined by Wolf (1978), a pioneering researcher in the area. Wolf used the term to refer to the acceptability, utility, and importance of treatment programs in changing a target behavior. Examining the social validity of the brief assessment model is important for two reasons. First, if teachers do not find the model acceptable, they may be unlikely to continue implementing the interventions after the researchers finish their study. Secondly, it is important that the results of brief assessment are meaningful and useful, not only in the one-on-one assessment situation, but also in the natural school context.

There is only one known study that explicitly examined the social validity of the brief assessment model. Chafouleas et al. (2003) empirically examined school psychologist’s acceptability of three different assessment models in an analogue situation. The three assessment models examined were norm-referenced assessment (NRA), curriculum-based assessment (CBA), and brief assessment model (BAM). Participants in this study were 500 randomly selected members of the National Association of School Psychologists (NASP), 188 of whom provided complete and useable data for the study. Each participant was randomly assigned to one of three conditions: BAM, NRA, or CBA. Each participant received a reading assessment packet that included a brief description of the assessment model, followed by a question asking the participants to rate their degree of training and use of the model on a Likert-type scale. In addition, each participant received a case vignette describing a use of the assessment model. The Assessment Rating Profile-Revised (ARP-R; Eckert, Hintze, & Shapiro, 1998), a 12-item Likert-type scale, was included at the end of the reading assessment packet in order to assess participants’ perceptions of the acceptability of the model. The results of this study indicated that the participants rated CBA as more acceptable than either BAM or NRA. Although there was no significant differences found between the acceptability of BAM and NRA, the mean ratings for BAM were higher than NRA for all but one question. It is important to mention that BAM was also the assessment model with which the participants reported the least experience (70% said
they had little or no training in BAM, whereas only 5% said they had little or no training in NRA). This is one limitation of the study due to the fact that limited exposure to BAM many have affected school psychologists’ acceptability of this model. A second limitation of this study is that more than 50% of the participants did not respond to the survey, indicating the sample may be biased. Finally, because this study utilized an analogue situation, it is unknown whether these results would be encountered in the “real world.”

As mentioned, there are currently no other studies that examine the social validity of the brief assessment model. However, the social validity of CBM, an important component of the brief assessment model, has been examined.

Eckert, Shapiro, and Lutz (1995) studied the acceptability of CBM versus norm-referenced assessment in 224 teachers in an analogue setting. Each teacher received a packet of information that included three components. First, each teacher received a four-sentence case description of a fourth grade student who was experiencing academic skill problems. Next, each teacher received data from one of the two assessment methods (CBM or norm-referenced assessment). Finally, each teacher received the Assessment Rating Profile (ARP), an 18-item five-point Likert-type scale questionnaire that assessed acceptability of assessment methods. Each teacher was given approximately 15 minutes to complete the questionnaire. Results indicated that teachers consistently viewed CBM as more acceptable that norm-referenced assessment. This finding is important since teachers may be more likely to implement interventions if they feel that the assessment is acceptable. Like other analog studies, the major limitation that should be addressed by future research is whether the results would be the same in a natural setting where the assessment actually occurred.

The aforementioned studies focused primarily on teacher acceptability, which is only one indicator of social validity. Another indicator of social validity is the extent to which the results of the assessment are viewed as important and meaningful. In Ohio’s current educational environment, with the emphasis on accountability and statewide achievement testing, one important indicator for many educators would be whether or not an assessment leads to interventions that improve a student’s outcomes on statewide
achievement tests. The Ohio Proficiency Test (OPT) is one such achievement test administered during the fourth, sixth, and ninth grades that assesses students’ academic achievement in many academic subjects including reading. Shroder (2002) examined whether or not CBM reading outcomes correlated with scores on the reading section of the fourth grade OPT, thus justifying the use of CBM. During four periods throughout a school year, 185 fourth grade students were administered CBM reading probes. It was discovered that the percentage of students who read 70 CWPM and subsequently passed the reading section of the OPT was only 4.2% to 12.5%. In contrast, 49%-55.3% of students who read above 70 CWPM passed the reading section and 55.5% to 70.7% of students who read above 100 CWPM also passed. Based on these data, it was determined that reading below 70 CWPM may be a predictor of failing reading scores on the OPT. This research indicates that CBM scores do correlate with scores on the OPT, and thus can be used as a benchmark measure to indicate which students need additional support to pass the reading section of the OPT. One issue not addressed in this study is whether reading interventions (such as those provided in the brief assessment model) lead to increases in both CBM scores and OPT scores.

Purpose of Proposed Study

There were several research questions addressed during the course of this study. The first two questions pertained to the brief assessment model in general, whereas the last four pertained to the social validity of the brief assessment model.

1. Did the current research confirm previous findings that brief assessment is accurate and useful in identifying individualized reading interventions?

2. Did the implementation of the individualized brief assessment reading interventions result in improvement in general reading performance of students, as measured by CBM?

3. Did participants’ standardized reading achievement test scores increase during the intervention period?

4. Did the gains experienced by students during the intervention generalize to their performance in school-wide CBM benchmark assessments in the area of reading?
5. Did teachers find the brief assessment interventions to be acceptable and effective in improving reading skills?

6. Did the gains experienced by students during the intervention generalize to their performance in the classroom as measured by reading grades?

Methodology

Participants and Setting

Five participants were included in this study. All participants were third grade students at Fairfield South Elementary School, a suburban school located in Southwest Ohio. Participants were chosen based on poor oral reading fluency performance as indicated by recent school-wide screening assessment. Four of the participants were female and one was male. One participant, April, was on an Individualized Education Plan (IEP) and attended a special education classroom for half the day due to speech and academic concerns. The other four participants were not on IEP’s, but received reading intervention services for thirty minutes each day. Written parental consent and verbal student assent were obtained for each participant prior to initiating the study (see Appendix A for parental consent form).

Examiners

Three school psychology graduate students from Miami University, including the author, were the examiners in this study. All three examiners had obtained master’s degrees in school psychology and were trained in brief assessment and tutoring procedures through a graduate level class in assessment and intervention. Training involved a combination of demonstration, discussion, role-play/practice, and readings.

Materials

The curriculum-based measurement (CBM) reading passages used in this study were selected from a variety of reading series. The passages did not include poetry or prose and included limited dialogue. In addition, the passages were re-typed in font similar to the actual text. All passages were controlled for grade level readability using the Fry (1977) readability method. This method is based on the premise that an increase in the number of syllables and words per sentence results in an increased reading level. Thus, the numbers of syllables and words per sentence in the first 100 words of the
passage were counted (Fry, 1977). Then, these two numbers were plotted on Fry’s readability graph, which indicated the grade level of the reading passage. This method has been demonstrated to be a reliable and valid indicator of readability (Fry, 1977; Fry, 1989). If a passage did not meet grade level readability based on the Fry method, words or sentences were slightly altered in structure (e.g., syllables), but not meaning, in order to meet the criteria.

Dependent Variables

There were six dependent variables of interest in this study: immediate CBM reading measures, general CBM reading measures, Ohio Third Grade Reading Achievement Test analysis, oral reading fluency growth rate, a social validity measure, and grade analysis.

Immediate CBM reading measures. This variable was calculated by using the correct words per minute (CWPM) on the final reading of each passage. This measure demonstrated the immediate effects of the intervention on that passage but did not reveal anything about the generalized effects. It was used to identify the least amount of treatment necessary to increase immediate performance in reading, as described in the procedures section below.

General CBM reading measures. This variable was measured by counting CWPM on the student’s initial reading of the passage, before the treatment condition was implemented. By using a general measure, the examiners were able to assess how the effects of the intervention conditions generalized over time to new passages.

Ohio third grade reading achievement test analysis. Reading scores from the Ohio Third Grade Reading Achievement Test were collected from each participant’s school files. During the third grade year, every student in Ohio takes the Third Grade Reading Achievement Test. This test measures several aspects of reading including vocabulary, word recognition, reading processes, and reading applications on informal and literary texts (Ohio Department of Education, 2003). The test was administered in October 2003 (before tutoring began) and again in March 2004 (after several months of tutoring). Each child was given a standard score on the test that corresponded to a particular category: Advanced, Accelerated, Proficient, Basic, and Limited. The cutoff
scores required for each category differed slightly for the October and March administration. Students scoring in the Limited range are described as not yet attaining basic reading skills. In the Basic range, students have some reading skills, but still need teacher support to understand grade-level reading materials. Students in the Proficient range can comprehend grade level reading materials with little or no teacher support. In the Accelerated range, students exhibit a wide range of reading skills and can understand grade-level reading materials independently. Finally, students in the Advanced range have reading skills that allow them to critically evaluate reading materials independently (Ohio Department of Education, 2003).

**Oral reading fluency growth rate.** Three times per year, all third grade students at the school were administered CBM oral reading fluency probes and CWPM was calculated. These data were collected by a school team as part of a school-wide benchmark assessment. Growth rate is the average number of CWPM per week a student has increased between any two administrations. Growth rate is calculated by subtracting the first administration score from the second administration score and then dividing by the number of weeks that passed between administrations. Deno, Fuchs, Marston, and Shinn (2001) reported that the average growth rate for the typical third grade student was +1 CWPM per week. However, the average growth rate for the typical third grade student receiving special education services was only approximately +.5 CWPM per week. Finally, after doing a meta-analysis of several research studies meeting rigid criteria for effectiveness of the reading intervention, Deno et al. discovered that the average growth rate for students receiving these highly effective individualized interventions was approximately +1.39 CWPM per week.

**Social validity measure.** Social validity was assessed using an adapted version of the Behavior Intervention Rating Scale (BIRS; Von Brock & Elliott, 1987; see Appendix B). The BIRS is a 24-item scale that assesses three factors related to the intervention: acceptability, effectiveness, and rate of change. The acceptability scale consists of 15 items, the effectiveness scale consists of 7 items, and the rate of change scale consists of 2 questions. The BIRS yielded a Cronbach’s alpha of .97 (Von Brock & Elliott, 1987). All items on the BIRS are positively worded, so that a response of “strongly agree”
indicates higher levels of acceptability/effectiveness/rate of change than a response of “strongly disagree.” The participants’ reading intervention teachers completed the BIRS.

Grade analysis. As will be discussed in the results and discussion sections, the grade analysis was not completed as intended. However, it was anticipated that each week, the teacher would photocopy his or her reading grade book. The names of the peers would be crossed out with a marker, so that the researcher could see the grades for all students on all assignments, without revealing peers’ identities. The researcher intended to compare the participants’ grades with five randomly selected peers in order to examine participant versus peer improvement during the treatment period.

Independent Variables

The independent variable in this study was the treatment condition(s) that was provided to each participant. The independent variable varied in type/intensity for each participant during Phase III and Phase IV (explained in procedures section), and included one or more of the following strategies: Incentive, Repeated Reading, Listening Passage Preview/Phrase Drill, and Easier Material.

Incentive. The purpose of this condition was to test whether an incentive would improve the participant’s reading performance. In this condition, the examiners first determined the participant’s goal based on a 30% increase above the median baseline (30% was chosen because literature recommendations vary from 20%-40% and it was thought 30% would be a reasonable choice). After determining the goal, the examiner asked the participant to pick his or her preferred prize coupon out of three coupon choices. The three choices were: award coupon (redeemed for a certificate), prize coupon (redeemed for trinkets, cards, erasers, or pens), and phone coupons (redeemed for a positive phone call home to parent or guardian). After the participant chose his or her preferred coupon, the examiner told him or her the goal that must be met to obtain the coupon. The participant then read a passage for 60 seconds while the examiner tracked errors. CWPM and EPM were calculated. If the participant achieved the goal, the preferred coupon and corresponding reward were provided; if not, encouragement and a consolation prize (e.g., a sticker) were provided.
Repeated Reading. This condition tested whether extra practice was needed to improve the participant’s reading performance. For this condition, the examiner asked the participant to read a passage a total of four times. The first three readings were untimed. On these readings, the examiner stopped the participant after reading approximately 30% past his or her highest previous CWPM, in order to allow sufficient practice without draining the participant. On the fourth timed reading, CWPM and EPM were calculated.

Listening Passage Preview/Phrase Drill. The purpose of this condition was to test whether more corrective feedback and modeling was necessary in order to improve the participant’s reading performance. During this condition, the examiner first read the story aloud while the participant followed along silently with his or her copy. Next, the participant was asked to read the passage aloud while the examiner used a highlighter to mark errors. The participant was allowed to read approximately 30% past his or her previous highest CWPM score. After this, the examiner pointed to each of the highlighted errors (up to 15) and read the word aloud to the participant. The participant was then instructed to read short phrases containing each error three times. Immediate error correction was provided for any errors. Then the participant read the passage a final time for 60 seconds while the examiner scored CWPM and EPM.

Easier Material. This condition tested whether the student’s skill level was poorly matched to the instructional materials. In this condition, the examiner asked the participant to read for 60 seconds from a passage one grade-level below his or her instructional level (i.e., second grade). CWPM and EPM were calculated.

Procedures

The procedures in this study consisted of five phases: problem identification, problem analysis, treatment strength, problem evaluation, and follow-up.

Phase 1: Problem identification. The purpose of the problem identification stage was to gather relevant background information about each participant and his or her strengths and weaknesses. This information was gathered through three procedures.

First, each participant’s reading teacher completed a teacher interview form. The interview form asked the teacher questions about the participant’s academic performance
compared to his or her peers, strengths and weaknesses, and other background information. (see Appendix C).

Next, a problem validation screening was conducted. This was accomplished through a school-wide assessment using CBM reading, writing, and math probes. This school-wide assessment was conducted by a school team who provided the examiners access to the data. Each participant’s performance on these skill probes was compared to the performance of his or her peers as well as to literature-based criteria. In addition, each participant was observed for 20-minutes during reading class using the Behavior Observation System (BOS; Jones, Wickstrom, & Friman, 1997). The BOS is a tool that can be used to identify problem behaviors exhibited in the classroom as well as to compare time-on-task to peers and discover any contingencies that may be maintaining problem behavior. It involves recording information about the student’s activity during 10-second intervals, as well as recording information about a randomly selected peer every third interval. Finally, each participant’s cumulative intervention history was reviewed. This included examining previous CBM benchmark scores, grades, and standardized test performances. The overall purpose of the problem validation screening was to validate that difficulties did exist in the area of reading and that assessment and intervention with the participant was justified.

The final step in this phase was to establish a stable baseline. This phase occurred in 30-minute individual sessions that took place two times per week. During every baseline session, participants read six instructional passages for one minute each as the examiner counted CWPM and EPM until a stable baseline was established. For the purposes of this study, a baseline was considered stable if: a) the difference between the lowest and highest baseline points was <20% and b) there was no upward trend in the data, meaning the last three baseline data points did not go in the same direction (Alberto & Troutman, 2003).

Phase II: Problem analysis. The brief assessment was implemented during the second phase. Over the course of two sessions, each participant was exposed to the following treatment conditions (in order): Incentive, Repeated Reading, Listening Passage Preview/Phrase Drill, and Easier Material. Each treatment condition was applied
to its own reading passage, and all participants were exposed to the reading passages in the same order. See Appendix D for actual instructions for each condition.

Based on the results from each of the conditions, the most effective condition was determined for each participant. In order for a condition to be effective, it showed at least a 30% improvement over the baseline CWPM. If more than one condition met this criterion, then the most effective condition was determined by considering the intrusiveness of the treatment and EPM.

Once the most effective condition was established, a mini-withdrawal and replication was conducted to establish a functional relationship. If the last administered condition automatically returned to near-baseline levels in a reversal, then the examiner proceeded by re-administering the most effective condition. However, if the last condition did not reverse, then the examiner re-administered the least effective condition followed by the most effective condition. Phase II was completed in two 30-minute sessions for all participants.

**Phase III: Treatment strength.** In this phase, the most effective treatment condition identified in the problem analysis phase was implemented as many times as possible during twice-weekly 30-minute sessions. The immediate CBM score was used for decision-making in this phase.

Once the effects of the condition stabilized, the examiner determined whether or not the median of the last three immediate data points met 100 CWPM, the literature-based criteria proposed by Shapiro (1996). If so, the examiner moved to Phase IV. If not, the next least intrusive treatment from Phase II was added to the current condition. This phase continued until the least amount of treatment necessary to increase immediate performance levels to literature-based standards was identified. The average length of Phase III across participants was 5.6 sessions (range= 2-8 sessions).

**Phase IV: Treatment evaluation.** Tutoring sessions using the treatment package determined in Phase III were implemented twice per week in Phase IV. In this phase, the general CBM score, rather than the immediate score, was used to evaluate progress. Both the general and immediate CWPM were tracked throughout this phase. Based on research by Deno et al. (2001), the expected growth rate during each week of an intervention
should be approximately +1 CWPM per week for third graders. Thus, a goal was set based on this criterion for a 16-week period and an aim-line was graphed to indicate expected levels of progress needed to meet the 16-week goal. The beginning of the aim-line started at the median of the last three problem analysis weekly median points and extended to the 16-week goal. A three-point decision rule was used to evaluate progress. This meant that if three consecutive general CBM data points fell below the aim-line, then the intensity (e.g., number of days per week) or type (e.g., treatment conditions) of the intervention was altered. The average length of Phase IV across participants was 24 sessions (range= 18 to 32 sessions).

In addition to the formative evaluation of the intervention, there was also a summative evaluation component. For each participant, the overall effectiveness of each intervention condition was evaluated on general CWPM based on calculating the percentage of non-overlapping data (PND) between baseline and treatment conditions. PND has been shown to be a meaningful indicator of the effectiveness of an intervention (Scruggs & Mastropieri, 1998). Generally, the higher the PND, the more effective the intervention. To calculate PND, a horizontal line is drawn across the graph from the highest baseline point through the treatment phase. The percentage of treatment data points found above this line is the PND (Scruggs & Mastropieri, 1998). Scruggs and Mastropieri (1998) proposed the following criteria for evaluating the effectiveness of an intervention based on PND: 50-70% PND indicates “questionable” treatment effects; 70-90% PND indicates “effective” treatment effects; and, 90% or above PND indicates “very effective” treatment effects.

Phase V: Follow-up. After the treatment evaluation, the examiners continued to collect scores for any reading fluency benchmarking and standardized tests. In addition, the BIRS was administered to the reading intervention teachers. A comprehensive report on each participant was also written and distributed to parents and school administrators. Finally, a presentation was given to the entire school staff on the process and results of the research project.
Design

The study was a within-subjects design. The same participants were exposed to each condition in the study (Goodwin, 1998). Phase II was also a modified multi-element design. As previously described, in this design the treatment conditions were presented in order from least intrusive to most intrusive and each treatment condition was generally only presented one time. During phases III and IV, however, a changing-criterion design was used, because the criterion was changed once stability was met.

Treatment Fidelity

Fidelity checklists were completed by each examiner to ensure that the correct procedures were followed during each treatment session (see Appendix E). On average, the examiners completed 99.6% of the procedures correctly (range=98% to 100%).

Inter-rater Agreement

Approximately 42% of all sessions conducted were coded by a second rater. The second rater listened to the tape-recorded student readings and calculated CWPM and EPM by marking errors on blank passages. Mean inter-rater agreement for CWPM was 98% (range= 96%-98%). Mean inter-rater agreement for EPM was 91% (range=85% to 95%).

Results

Brief Assessment and Tutoring Results

Phase I: Problem identification. Data available from school-wide CBM norming in October, 2003 indicated all five participants were discrepant from their peers on oral reading fluency. The mean for all third grade students at the school was 100 CWPM versus a mean of 55.2 CWPM for the five participants. The individual data for the five participants was: Amy- 58 CWPM; April- 48 CWPM; Katie- 64 CWPM; Tammy- 62 CWMP; and, Tim- 44 CWPM. Although some participants were slightly discrepant from peers in other academic domains, such as written expression, oral reading fluency appeared to be the greatest concern for all participants (see Figure 1). Data from teacher interviews supported the need for further assessment and intervention in reading for all participants. The classroom observations using the BOS did not reveal any major attention or behavioral problems that might explain the participants’ academic concerns.
Figure 1. Problem Identification: Comparison of participants, peers, and literature-based norms on reading (correct words per minute), written expression (total words written in three minutes), mixed math (correct digits per minute), and social measures (% of time on task).
Phase II: Problem analysis. The results from this phase addressed research question number one: “Did the current research confirm previous findings that brief assessment is accurate and useful in identifying individualized reading interventions?” Results indicated that the answer to this question was yes for all participants. The treatment selected for each participant based on the brief assessment process was highly individualized, and an effective treatment condition based on the 30% criterion was identified for each participant. Repeated Reading was selected for further evaluation for two participants and Phrase Drill was chosen for three participants. Following is a more extensive description of the results of the brief assessment process.

For Amy, three treatment conditions in the brief assessment were considered effective based on the 30% criteria: Incentive (90 CWPM), Repeated Reading (128 CWPM), and Phrase Drill (93 CWPM). Although Repeated Reading produced the greatest increase in CWPM over the baseline of 59 CWPM, Incentive was chosen for replication because it was the least intrusive, effective condition. However, when Incentive was repeated, the results were not replicated and it was no longer considered effective. Thus, Repeated Reading was repeated, and this condition was effective during the reversal. Thus, Repeated Reading was chosen for evaluation in Phase III. See Figure 2.

During April’s brief assessment, two conditions were considered effective: Repeated Reading (58 CWPM) and Phrase Drill (78 CWPM). Repeated Reading was repeated because it was the least intrusive, effective intervention. The results were replicated; therefore, Repeated Reading was chosen for further evaluation. See Figure 2.

For Katie, the brief assessment resulted in two effective treatment conditions: Repeated Reading (129 CWPM) and Phrase Drill (116 CWPM). The results of Repeated Reading could not be replicated, however, whereas the results from Phrase Drill were replicated. Thus, Phrase Drill was chosen for further evaluation. See Figure 2.

The brief assessment indicated Repeated Reading (86 CWPM) and Phrase Drill (107 CWPM) were both effective conditions for Tammy. However, upon replication, the results of Repeated Reading were not effective. Thus, Phrase Drill was repeated and the effective results were replicated. See Figure 2.
Figure 2. Problem analysis and treatment strength: Correct words per minute (CWPM) and errors per minute (EPM) as a function of the four treatment conditions and/or combinations of treatment conditions.

Legend

IN= Incentive
RR= Repeated Reading
PD= Listening Passage Preview/Phrase Drill
EM= Easier Materials

• Correct Words per Minute (CWPM)
• Errors per Minute (EPM)
The brief assessment resulted in only one effective condition for Tim: Phrase Drill (82 CWPM). The results of phrase drill were replicated, so it was determined this condition would be used in Phase III. See Figure 2.

**Phase III: Treatment strength.** The results from this phase were also highly individualized due to the fact that individual data dictated treatment strength for each participant. Following is a description of the results of this phase for each participant. For Amy, the median of the last three immediate data points during the Repeated Reading intervention was not above the goal of 100 CWPM. Thus, based on the decision rule, it was determined the Incentive condition would be added to the treatment package. This Repeated Reading + Incentive condition resulted in meeting the 100 CWPM median goal. Thus, the treatment strength necessary involved two treatment conditions: Repeated Reading and Incentive. See Figure 2.

For April, the median of the last three immediate data points was below 100 CWPM. Thus, Incentive was added to Repeated Reading. Likewise, this treatment package was not effective based on the 100 CWPM criteria. Finally, after adding Phrase Drill to the package, the median of the last three points exceeded 100 CWPM. April’s final package was Repeated Reading + Incentive + Phrase Drill. See Figure 2.

For Katie, the median of the last three immediate points in the Phrase Drill condition exceeded 100 CWPM. Thus, it was determined that Phrase Drill was the only treatment condition necessary. See Figure 2.

Similar to April, Tammy required the Repeated Reading + Incentive treatment package to bring the median of the immediate scores over the 100 CWPM goal. See Figure 2.

For Tim, it was determined that the median of the last three CWPM immediate points was not above the benchmark of 100. Thus, Incentive was added to Phrase Drill. However, this package also did not result in the median of the last three points meeting the goal of 100. Thus, Repeated Reading was added to the treatment package. During this treatment condition (Incentive + Phrase Drill + Repeated Reading), the median of the last three points was above 100. Thus, this condition was chosen for further evaluation in the next phase. See Figure 2.
**Phase IV: Treatment evaluation.** The results of this phase addressed research question number two: “Did the implementation of the individualized brief assessment reading interventions result in improvement in general reading performance of students, as measured by CBM?” Results indicated that all participants improved in their general reading performance, but to varying degrees.

Based on the expected growth rate of +1 CWPM per week, Amy’s general goal for the 16-week period was 80 CWPM. Based on the three-point decision rule, it was determined that this treatment was effective: no three consecutive data points fell below the aim line during the entire 16-week period. Because the treatment package resulted in gradual general CWPM gains for Amy, it was not necessary to increase or alter the frequency of treatment. In addition, Amy’s percentage of non-overlapping data was 100%, indicating the intervention “very effective” based on the criteria proposed by Scruggs and Mastropieri (1998). See Figure 3.

April’s goal for 16 weeks was 64 CWPM. During the treatment period, no three consecutive general data points fell below the aimline; thus, no further alteration to the treatment package was necessary. April’s percentage of non-overlapping data was 71%, indicating the intervention was “effective” based on Scruggs and Mastropieri’s (1998) criteria. See Figure 3.

Katie’s goal for the 16-week period was 91 CWPM. Although the intervention only lasted 12 weeks for Katie (due to the end of the school year), she was progressing along the aimline the entire time. The intervention appeared to be effective with sufficient intensity; however, Katie’s PND was 33%. This indicates that only 33% of the intervention points were higher than the highest baseline median. According to Scrugg and Mastropieri (1998), this intervention would rate below “questionable”, indicating that based on the PND criteria it was not very successful. See Figure 3.

Unlike the other participants, whose treatment strength was sufficient, Tammy needed more support to meet her needs. Tammy’s goal was 89 CWPM by 16 weeks. After eight weeks of intervention, it became evident that two sessions per week was not enough support to meet her needs (see Figure 6). Tammy’s data points were falling consistently below the aim line. Thus, the decision was made to increase her intervention
TREATMENT EVALUATION

Figure 3. General Correct words per minute as a function of Baseline, Problem Analysis, and Treatment Evaluation phases.

Legend

CWPM= Correct Words per Minute
BL= Baseline
PA= Problem Analysis Phase
2x= Phase IV intervention provided twice per week
3x= Phase IV intervention provided three times per week
to three sessions per week. After implementing this change, Tammy’s general CWPM increased enough so that she was progressing well along the aim line. Tammy’s PND was 50% for the baseline vs. the total intervention period; however, when you examine her PND from baseline to the final intervention strength of three times per week, her PND becomes 100%. This indicates that she needed the greater intensity intervention to result in “very effective” status. See Figure 3.

Tim’s goal was to reach 69 CWPM by the 16th week. Based on the three-point decision rule, the treatment was effective after the third week of treatment. After the third week, the data fell consistently above the aim-line. Thus, the treatment was not altered and was considered to be effective. However, Tim’s PND was 59%, indicating “questionable” treatment results (Scruggs & Mastropieri, 1998). See Figure 3.

### Social Validity Results

**Standardized test analysis.** The results of the standardized test analysis addressed research question number three: “Did participants’ standardized reading achievement test scores increase during the intervention period?” All of the participants completed the Ohio Third Grade Achievement Test in October 2003 and March 2004 (see Table 1). The first test administration occurred prior to the implementation of treatment for all participants, whereas the latter test administration occurred after approximately two to five months of treatment (depending on when the participant began treatment).

Amy scored in the Limited range in October, placing her below the Proficient range cutoff. However, in March her score increased to the Accelerated Range. April’s score changed from the Limited range in October to the Proficient range in March. Although Katie’s score increased slightly from March to October, she remained in the Basic range on both test administrations. Tammy scored in the Limited range on the first test administration. On the next administration, she advanced to the Accelerated range. Tim scored in the Limited range on the first test administration. In March, he increased to the Basic range. Although he did not reach the Proficient range, he did demonstrate improvement between October and March. In summary, all participants improved their score from the first to second test administration. However, only four of the five participants improved at least one category level. No participants reached the Proficient range.
level or higher in October. However, in March three of the five participants exceeded this level. Finally, four of the five participants exceeded the state average improvement between test administrations.

Table 1

_Third Grade Reading Achievement Test Results in October 2003 vs. March 2003_

<table>
<thead>
<tr>
<th>Standard Score Category</th>
<th>October</th>
<th>March</th>
<th>Change</th>
<th>October</th>
<th>March</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohioa</td>
<td>401.84</td>
<td>415.72</td>
<td>+13.88</td>
<td>Proficient</td>
<td>Accelerated</td>
<td>+1 level</td>
</tr>
<tr>
<td>Amy</td>
<td>380</td>
<td>424</td>
<td>+44</td>
<td>Limited</td>
<td>Accelerated</td>
<td>+2 levels</td>
</tr>
<tr>
<td>April</td>
<td>382</td>
<td>412</td>
<td>+30</td>
<td>Limited</td>
<td>Proficient</td>
<td>+2 levels</td>
</tr>
<tr>
<td>Katie</td>
<td>385</td>
<td>393</td>
<td>+8</td>
<td>Basic</td>
<td>Basic</td>
<td>+0 levels</td>
</tr>
<tr>
<td>Tammy</td>
<td>371</td>
<td>417</td>
<td>+46</td>
<td>Limited</td>
<td>Accelerated</td>
<td>+2 levels</td>
</tr>
<tr>
<td>Tim</td>
<td>380</td>
<td>391</td>
<td>+17</td>
<td>Limited</td>
<td>Basic</td>
<td>+1 level</td>
</tr>
</tbody>
</table>

*Note.* Change refers to the amount of change in standard score or category level between the October and March test administrations.  
^aOhio refers to the mean performance of all third grade students who took the test in Ohio

_Oral reading fluency growth rate.* This domain addressed research question number four: “Did the gains experienced by students during the intervention generalize to their performance in school-wide CBM benchmark assessments in the area of reading?” Three times per year, CBM oral reading fluency probes were administered to all third grade students, as part of a school-wide benchmark assessment. By translating this data into growth rate, inferences can be made as to whether or not the treatment results have generalized to other settings. Growth rate is the average number of CWPM per
week a student has increased between CBM administrations. When interpreting these data, it is important to have a reference point for what the typical growth rate is. The average growth rate at Fairfield South was +.91 CWPM per week from winter to spring ‘04. The goal set for the five participants was a growth rate of +1 CWPM per week. Finally, Deno et al. (2001) discovered that the typical special education student experiences a growth rate of +.5 whereas highly effective special education services should ideally result in a growth rate of +1.39.

Between winter ’03 and spring ’03, Amy’s oral reading fluency growth rate was - .36 CWPM per week. Between spring ‘03 and fall ‘03, her growth rate increased to +0 CWPM per week. Intervention was initiated with Amy in October, just after the fall CBM administration. From fall ’03 to winter ’04, her growth rate increased substantially, to approximately +1.57 CWPM per week. Finally, between winter ’04 and spring ’04, her growth rate increased to +2.0 CWPM per week. See Table 2.

April’s growth rate from winter ’03 to spring ’03 was +0 CWPM per week. From spring ’03 to fall ’03, her growth rate increased slightly to +.32 CWPM per week. From fall ’03-winter ’03, her growth rate increased again to +.57 CWPM per week. Intervention for April began in January. From winter ’04 to spring ’04, her growth rate nearly doubled from the previous period to +.93 CWPM per week. See Table 2.

Katie’s growth rate was +1.14 CWPM per week from winter ’03 to spring ’03. However, from spring ’03 to fall ’03, her growth rate decreased to -.54 CWPM per week. From fall ’03-winter ’04, Katie’s ORF growth rate was -.07 CWPM per week. She began intervention in January. After intervention began, her growth rate was +2.8 CWPM per week. See Table 2.

From winter ’03 to spring ’03, Tammy’s growth rate was +.64 CWPM per week. However, from spring ’03-fall ’03, her growth rate decreased to -.18 CWPM per week. Treatment for Tammy began in October. After treatment began, her growth rate from fall to winter was +.5 and her growth rate from winter to spring was +1.53. See Table 2.

Tim’s growth rate from winter ’03 to spring ’03 was -.20 CWPM per week. From spring ’03 to fall ’03, his growth rate increased slightly to -.18 CWPM per week.
Table 2

Oral Reading Fluency Growth Rate Before and During Treatment vs. Peers and Effective Special Education Standards

<table>
<thead>
<tr>
<th>Name</th>
<th>Winter 03-Spring 03 (15 weeks)</th>
<th>Spring 03-Fall 03 (22 weeks)</th>
<th>Fall 03-Winter 04 (14 weeks)</th>
<th>Winter 04-Spring 04 (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>
</tbody>
</table>

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

Treatment for Tim began in October ‘03. From fall to winter, his growth rate was +1.14 CWPM per week. From winter to spring, his growth rate increased to +1.67 CWPM per week. See Table 2.

Overall, the average growth rate across all participants prior to starting the intervention was +.095 CWPM per week. The average growth rate across all participants during the intervention period was +1.5 CWPM per week.

Social validity measure. Examining the social validity measure addressed research question number five: “Did teachers find the brief assessment interventions to be acceptable and effective in improving reading skills?” In May, 2004, the participants’ reading intervention teachers completed a modified version of the Behavior Intervention Rating Scale (BIRS; Von Brock & Elliott, 1987) (see Appendix B). All items were on a 5-point scale, where 1= strongly disagree and 5= strongly agree. See Table 3 for means and standard deviations of each item.

The overall average rating for each participant was as follows: Amy- 4.61; April- 3.46; Katie-5.00; Tammy- 4.30; Tim- 4.63. Based on the standard that anything 4 or above indicates
Table 3  
* Means and Standard Deviations of Teacher Responses to the Behavior Inventory Rating Scale (BIRS) Items  

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This was an acceptable intervention for the child’s reading concerns</td>
<td>4.8</td>
<td>.45</td>
</tr>
<tr>
<td>2. Most teachers would find this intervention appropriate for other reading problems</td>
<td>4.6</td>
<td>.55</td>
</tr>
<tr>
<td>3. The intervention proved effective in improving the child’s reading skills</td>
<td>4.8</td>
<td>.84</td>
</tr>
<tr>
<td>4. I would suggest the use of this intervention to other teachers</td>
<td>4.8</td>
<td>.45</td>
</tr>
<tr>
<td>5. The child’s reading concerns were severe enough to warrant the use of this intervention</td>
<td>5.0</td>
<td>1.22</td>
</tr>
<tr>
<td>6. Most teachers would find this intervention suitable for reading concerns</td>
<td>4.8</td>
<td>.45</td>
</tr>
<tr>
<td>7. I would be willing to use this intervention in the classroom setting</td>
<td>5.0</td>
<td>0</td>
</tr>
<tr>
<td>8. The intervention would <em>not</em> result in negative side-effects for the child</td>
<td>4.6</td>
<td>.55</td>
</tr>
<tr>
<td>9. The intervention would be appropriate for a variety of children</td>
<td>5.0</td>
<td>0</td>
</tr>
<tr>
<td>10. The intervention is consistent with those I have used in classroom settings</td>
<td>5.0</td>
<td>0</td>
</tr>
<tr>
<td>11. The intervention is a fair way to handle the child’s reading concerns</td>
<td>4.6</td>
<td>.89</td>
</tr>
<tr>
<td>12. The intervention is reasonable for the child’s reading concerns</td>
<td>4.4</td>
<td>1.34</td>
</tr>
<tr>
<td>13. I like the procedures used in the intervention</td>
<td>4.6</td>
<td>.89</td>
</tr>
<tr>
<td>14. The intervention is a good way to handle this child’s reading concerns</td>
<td>4.4</td>
<td>1.34</td>
</tr>
<tr>
<td>15. Overall, the intervention was beneficial for the child</td>
<td>5.0</td>
<td>.71</td>
</tr>
<tr>
<td>16. The intervention quickly improved the child’s reading skills</td>
<td>3.6</td>
<td>1.52</td>
</tr>
<tr>
<td>17. The intervention produced lasting improvements in the child’s reading skills</td>
<td>3.7</td>
<td>2.08</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>3.0</td>
<td>1.58</td>
</tr>
<tr>
<td>19. Soon after the intervention started, a positive change in classroom performance was noticeable</td>
<td>3.2</td>
<td>1.79</td>
</tr>
<tr>
<td>20. The child’s reading fluency will remain at an improved level even after the intervention is discontinued</td>
<td>4.8</td>
<td>.84</td>
</tr>
<tr>
<td>21. The effects of the intervention will help the student in other academic subjects</td>
<td>4.8</td>
<td>.45</td>
</tr>
<tr>
<td>22. The child’s reading skills were closer to his or her peers after the intervention</td>
<td>4.6</td>
<td>1.14</td>
</tr>
<tr>
<td>23. The intervention produced enough improvement in the child’s reading that it is no longer a concern</td>
<td>2.8</td>
<td>1.48</td>
</tr>
<tr>
<td>24. Other concerns related to reading are likely to be improved by this intervention</td>
<td>4.4</td>
<td>.89</td>
</tr>
</tbody>
</table>

*Note.* All items are scored on a 5-point scale: 1= strongly disagree to 5= strongly agree. N=5.
some degree of acceptability, these ratings indicate that in every case except for April the teachers viewed the brief assessment model as acceptable and effective. April’s teacher reported mixed feelings on the effectiveness and rate of change of the brief assessment.

Within the overall survey, there were three subscales: acceptability, effectiveness, and rate of change. Because the rate of change scale consisted of only two questions, the results from that scale will not be reported. Overall, the teachers indicated higher levels of acceptability than effectiveness. The median acceptability score was 5.0 versus the median effectiveness score of 4.0.

After doing an item analysis across the five participants, it became clear that some items received lower ratings than others. The two items receiving the lowest average ratings were “The intervention produced enough improvement in the child’s reading that it is no longer a concern” and “The intervention improved the child’s reading to the point that it did not noticeably deviate from peers.” On the other hand, five items received an average rating of 5.0. These included “Overall the intervention was beneficial for the child”, “I would be willing to use this intervention in a classroom setting,” and “The child’s reading concerns were severe enough to warrant the use of this intervention.”

Grade analysis. The grade book analysis was intended to address research question number six: “Did the gains experienced by students during the intervention generalize to their performance in the classroom as measured by reading grades?”. Despite the importance of this question, the researchers were not able to gather the necessary grade book information in order to adequately analyze whether the results generalized to classroom performance. There were several reasons for this, including lack of centralized grading database, demand on teachers’ time and resources, and inadequate communications between researchers and faculty.

Discussion

Interpretation of the Findings

This research aimed to discover answers to six questions. The first question asked whether or not the findings from this study would confirm previous findings that a brief assessment can be used to isolate effective interventions for students. The results of this study did confirm these findings. Each participant in the study had at least one treatment condition that was effective based on the 30% criteria. In addition, all of the participants improved their
general reading by the end of the treatment. This supports previous research findings that brief assessment is a valid assessment tool for identifying effective interventions (e.g., Daly, Martens, Dool, & Hintze, 1998; Jones & Wickstrom, 2001).

The second question sought to answer whether the implementation of these individualized reading interventions resulted in improvement in general reading performance as measured by CBM. In fact, every participant improved his or her reading performance based on the three-point decision rule. PND corroborated the effectiveness of the treatment for Amy, April, and Tammy. The PND for Katie and Tim did not indicate that the intervention was effective; however, neither Katie nor Tim fell consistently below their aim-line. This might be explained by higher than usual baseline points or more sporadic growth.

Third, it was hoped this study would indicate whether or not the gains participants made in the treatment sessions resulted in improved performance on standardized tests. To answer this question, pre- and post-treatment performances on the Ohio Third Grade Reading Achievement Test were qualitatively examined. All five participants improved from the pre- to post-treatment test administrations, but to varying degrees. Amy and Tammy improved substantially at a rate more than three times the state average, and exceeded the Proficient benchmark on the second test administration. April also improved substantially, at a rate more than twice the state average, and met the Proficient benchmark on the second test administration. Tim and Katie, on the other hand, displayed much slower growth and did not reach the Proficient benchmark.

Fourth, this study intended to explore whether the gains experienced by students during the intervention generalized to their performance in school-wide CBM benchmark assessments in the area of reading. Results indicated that all students met or exceeded the growth rates of their peers during the intervention period. In addition, all students met or exceeded their growth rate from the previous period. Overall, the average growth rate across all participants prior to starting the intervention was +.095 CWPM per week vs. +1.5 CWPM during the treatment period. Although a causal relationship cannot be definitively drawn, these data provide some evidence to the effectiveness of the brief assessment intervention.

Fifth, it was hoped information would be gathered on teacher acceptability and perceived effectiveness of brief assessment interventions. Overall, results from the BIRS were positive. The overall mean response across participants (with 1 indicating strongly dissatisfied and 5
indicating strongly satisfied) was 4.4. However, some items received higher responses than others. The item with the lowest mean response was “The intervention improved the child’s reading to the point that it did not noticeably deviate from peers”. This indicates that although the intervention may have helped, the teachers did not perceive it to improve participants’ reading to be equal to their peers. In general, teachers perceived the brief assessment interventions as more acceptable than effective. The high acceptability of these CBM-based interventions corresponds with the findings of Eckert et al. (1995).

Finally, this study was designed to examine whether or not the oral reading fluency gains experienced by the participants translated into higher classroom grades. Unfortunately, these data could not be fully gathered due to administrative and communication concerns between the researchers and the school staff.

**Limitations of the Study**

The results of this study must be interpreted with caution due to several limitations. Although the primary purpose of single-subject research is to find an intervention that is appropriate for each individual participant, one limitation is that the results cannot necessarily be generalized to larger populations due to the small sample size.

Another limitation is that all the conclusions being made are based on the assumption that any improvement in oral reading fluency is directly due to the treatment being provided in twice or thrice weekly 30-minute sessions. In fact, there were numerous outside variables that could not be controlled and possibly also led to the participants’ improvement. For example, effective classroom instruction, outside tutoring or reading programs, and parent assistance at home may all have contributed to the participants’ successes. This study attempted to control for as many of these factors as possible by comparing growth rates to peers (who received the same classroom instruction) or to the participant before receiving treatment; however, ultimately not all variables could be accounted for.

In addition, it is possible that the incentives provided to students in the incentive condition were not reinforcing or motivating to the students. The researchers attempted to control for this by providing a variety of reinforcers from which to choose; however, it is unclear whether or not the choices were motivating to the students.
Another limitation is that the BIRS was completed by the reading intervention teacher, but not the regular education teacher. Because the reading intervention teachers are trained in a variety of reading interventions, they may be more acceptable of these procedures in general than classroom teachers.

Finally, there was no assessment of the long-term effects or maintenance of the intervention. There is no way to guarantee that the effects of the intervention will continue even after the intervention is withdrawn.

**Directions for Future Research**

In future studies, it would be very beneficial to assess the impact of the intervention on classroom grades. Perhaps finding a method of collecting this data that would be less intrusive to teachers and require less time might be useful. Or, including teachers more in meetings so that they are more fully aware of the process and utility of the research might reduce teacher resistance.

In addition, it would also be useful to examine the long-term effects of the intervention(s) selected through the brief assessment process. For example, it would be interesting to follow up with these participants each year through school-wide benchmark assessments to see if the results were maintained even after the intervention was withdrawn.

More research is also needed on how to use this model in conjunction with a response to intervention model for special education eligibility determination. As mentioned in the introduction, decisions for special education eligibility have traditionally been made on the basis of invalid and unreliable discrepancies between ability and achievement. However, a new alternative is to make eligibility decisions based on data showing that even when given increasingly intense interventions, the student still does not improve to a desired level. Fairfield South Elementary, the school used in this study, is planning on using the data gathered to support eligibility decisions on one of the participants. More research on evaluating the effectiveness of using brief assessment data for this purpose would be beneficial.

Finally, it would be beneficial to actually train classroom teachers or educational aides in the brief assessment model and have them implement it in the natural setting. Obviously the researchers will not be in the school forever, and it would be interesting to see if the procedures are feasible for school staff to implement in the absence of researchers.
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
Shelainna 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 not 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>
</tbody>
</table>
21. The effects of the intervention will help the student in other academic subjects

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

22. The child’s reading skills were closer to his or her peers after the intervention

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

23. The intervention produced enough improvement in the child’s reading that it is no longer a concern

<table>
<thead>
<tr>
<th></th>
<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></th>
<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:

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

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

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

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

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

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

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

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

<table>
<thead>
<tr>
<th>Disruptive Classroom Behavior</th>
<th>Lowest 10%</th>
<th>Lower 20- 30%</th>
<th>Middle 40%</th>
<th>Upper 20%-30%</th>
<th>Highest 10%</th>
</tr>
</thead>
</table>
**Critical Social**

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

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

REPEATED READING

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

Notes

Fidelity Checklist for

REPEATED READING

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

Notes
Fidelity Checklist for  

LPP/PHRASE DRILL

LPP/Phrase Drill
Session No. _____ Date: ________________ Phase ________________

Selected passage. Code __________

Assessed general performance  CWPM _____ Errors ______

IOA: ______

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

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

___Instructions

Assessed instructional performance  CWPM:_____ Errors ______

IOA: ______

Notes
Fidelity Checklist for

INCENTIVE + REPEATED READING

Incentive + Repeated Reading

Session No. ______ Date: ________________ Phase ________________

Selected passage. Code __________

Assessed general performance CWPM ______ Errors ______ __________

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

Reward coupon selected: ____________

___ Student read instructional passage 2 times

___ Instructions (make reference to goal)

Assessed instructional performance CWPM:____ Errors ______ __________

IOA: _______

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

Notes
Fidelity Checklist for

INCENTIVE + LPP/PHRASE DRILL

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

Notes
Fidelity Checklist for
INCENTIVE + 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