ABSTRACT

IMMEDIATE AND GENERAL EFFECTS OF THE BRIEF ASSESSMENT MODEL ON ELEMENTARY-AGED STUDENTS’ ORAL READING FLUENCY

by Jeffrey R. Schuka

The purpose of this study was to examine the efficacy of an evidence-based assessment model and its effectiveness in producing sustainable long-term gains on the oral reading fluency skills of five, identified as at-risk in reading, elementary-aged students. The immediate and generalized effects of student’s response to intervention were examined in relation to data-based decision making rules. Results suggest that the implemented four-phase model was able to identify a most effective intervention strategy, or combination of strategies, that led to gains in oral reading fluency that met or surpassed literature-based standards for acquisition.
IMMEDIATE AND GENERAL EFFECTS OF THE BRIEF ASSESSMENT MODEL
ON ELEMENTARY-AGED STUDENTS’ ORAL READING FLUENCY

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Dedication

This paper is dedicated to my loving wife, KyungHee, and beautiful son, Wyatt Joshua. KyungHee, it was really by your faith, support, prayers, patience, and unconditional love that I had the strength to finish this project. Thank you so much Kyung. I love you more!
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INTRODUCTION

The role of the school psychologist has undergone a dramatic change from the profession’s traditional service delivery system of years past (Reschly, 1988a, b). This new role calls for psychologists to be scientifically-based practitioners that are highly skilled in the areas of assessment and intervention. The school psychologist must be an expert whose focus rests not only on identifying disabilities that are adversely affecting student educational performances, but an expert who can use assessment data for the production and measurement of practical intervention strategies as well. This break with the traditional test-and-place model of school psychology past presents a call for new assessment methodologies and instruments that can directly link assessment to intervention.

The purpose of this research was to examine the efficacy of a hierarchical assessment model by way of offering individualized services to five elementary-aged students who were identified as being at-risk in reading. This study was part of a larger study between Miami University and University of Cincinnati school psychology programs that included eight other elementary-aged students. It was expected that the students involved with this study would significantly increase their learning rate, while a sequential and empirical data set for data-based decision making would be produced. This research project attempted to provide a valid and reliable model for linking assessment to intervention, while assessing and intervening with each student as an individual. Additionally, this study established progress monitoring decision rules that were used to weekly evaluate the student’s progress, while keeping careful record of the student’s improvement, or lack of. Progress monitoring was for the purpose of discovering the best intervention or combination of interventions, which lead to each student’s greatest measurable academic improvement in reading. Finally, this study looked for a relationship between the immediate and generalized effects of intervention based outcomes.

LITERATURE REVIEW

Traditional Verses Contemporary Psychoeducational Assessment

With limited finances, time, and human resources in our schools, there is an ever-increasing need for effective interventions for students with academic deficiencies and disabilities. The 2002 National Assessment of Educational Progress documented an unprecedented 36% of fourth grade students in the United States as having reading skills that are below the basic level of reading achievement (National Assessment of Educational Progress,
Traditional assessments by school psychologists and special education professionals have yielded results, through traditional psycho-educational assessment means, that have not been grounded in an adequate research base to show that these assessments are improving learning or academic performance (Gresham & Witt, 1997). Historically, the role of the school psychologist emphasized the assessment of children’s cognitive ability and measured academic achievement as the basis for eligibility and placement determination in special education (Fagan & Wise, 2000). Decisions were made with standardized instruments such as the Weschler Intelligence Scale for Children [WISC; Weschler, 2003] and the Weschler Individual Achievement Test [WIAT; Wechsler, 2002]. If a severe enough discrepancy was found between cognitive ability and academic achievement, then a student would qualify for special education services.

A substantial body of literature critiques the ability-achievement discrepancy approach and its’ heavy emphasis and reliance on cognitive scores. These scores offer practically no information for the development or implementation of academic intervention efforts (Kavale & Forness, 2000; Gresham & Witt, 1997; Siegel, 1989) and have also proven to be less than reliable. In 1979, Roffe and Bryant conducted an analysis of the reliability of cognitive scores for preschool and primary grade children. Students were retested after a three to six week interval. The results indicated that in 70.9% of the cases, at least one of the scales contributing to the full scale cognitive score changed enough to alter a psychologist’s interpretation of the student’s profile. In a separate study, the probability of consistent classification, based on test scores, was found to range from 19.4% to 42.6% (McDermott, Fantuzzo, Glutting, Watkins, & Baggaley, 1992). These traditional methods of assessment have not produced adequate or consistent results for students (Gresham, 2002; Reschly & Ysseldyke, 2002).

With a lack of utility in these assessments, curriculum-based measurement (CBM) has been advocated as a way to create a more productive link between assessment and treatment (Shapiro, 1996). Curriculum-Based Measurement is an alternate form of assessment that consists of a series of short tasks that a child will perform with an administrator (Deno, 1986; Fuchs & Fuchs, 1984, 1986; Shinn, 1989). The tasks are direct skills assessments, usually in one of the core disciplines of education (e.g., reading fluency, math), and resulting scores can be compared to the norms developed through the administration of the same tasks to grade-level peers. Among other things, CBM can help determine if the materials that a student is using are too easy or difficult, aid in setting short and long-term goals for a student, assist in developing
and measuring the effectiveness of an intervention, and provide an empirical data set for accountability and progress monitoring (Shapiro, 1996).

An example of CBM would be the administration of a grade level reading passage to a student by having the student read for one minute and at the end of that minute record the number of correct words the child was able to read. The process would be repeated with two other passages and a mean score would be recorded for how many words the child was able to correctly read in one minute. All of the child’s classmates would be administered the same passages, one minute timing, and receive a mean score of correct words per minute (CWPM). All mean scores would be rank ordered. This measure of fluency is most important when considering the larger picture of reading. Fluency provides the bridge between word recognition and reading comprehension that is necessary for a student to master the skills of reading (National Reading Panel, 2003). By comparing a child's mean score to rank ordered peer scores of the same grade level, it can be easily determined how well a student is doing in learning basic skills. CBM’s reliability and validity for measuring a student’s competence and development of that competence (with subsequent CBM measures) in the subject areas of reading, spelling, mathematics, and written expression has been demonstrated in over 200 published studies in peer-reviewed journals (Fuchs & Fuchs, 2003).

Experimental Analysis

Once it is determined that a student has some type of deficiency, a way to alleviate and correct for this deficit must be sought out. A strategy called an “experimental analysis,” based on the examination and manipulation of an independent variable (i.e., an intervention or treatment strategy) while observing the effects this variable has on the student’s behavior (i.e., reading), is carried out. Experimental analysis gained popularity in educational assessment during the 1980’s when researchers realized the value this assessment model held for education. Initially, it was used to identify variables suspected of promoting the continuation of severe behavior problems in individuals with developmental disabilities (e.g., Iwata, Dorsey, Slifer, Bauman & Richman, 1982).

Based on the constructs of the experimental analysis, Daly, Witt, Martens, and Dool (1997) formulated an academic functional assessment model that extended experimental analysis procedures to the academic domain. Design elements from the original experimental analysis model were modified so that the analysis could be performed on academic skills in the school
setting for the purpose of a quick and efficient analysis of two or more potential treatment conditions. This functional analysis for academics recognizes changes in behavior, just as its predecessor the experimental analysis did, that are then used to formulate a hypothesis as to why the behavior occurs. The functional analysis examines patterns of events or behaviors that precede the occurrence of the behavior, follow the occurrence of the behavior, and seeks to answer the question as to whether the student can be taught a more appropriate behavior (Alberto & Troutman, 2003). The main goal of the functional analysis is to examine and document the effect of a variable’s presence, absence, increase, or decrease on a particular behavior (Alberto & Troutman, 2003). This academic model proposed by Daly et al. is referred to as the brief assessment model.

Brief Assessment Model

The brief assessment presents a framework that promotes the examination for utility, evaluation, and comparison of academic interventions with precision and speed. Once a brief assessment is completed, a practitioner will be left with empirical results that, when analyzed, will show which interventions are likely to produce the highest gains for the student (Martens, Eckert, Bradley & Ardoin, 1999). This functional “brief assessment” provides empirical information regarding the strengths, weaknesses, and effectiveness of specific intervention strategies on student performance. Daly et al.’s model is based on five common reasons why students fail to achieve. These five hypothesized reasons can be used as a guide in the selection of possible interventions for the child.

Five Hypotheses

The first hypothesis states that a student has no desire to do the work due to a lack of motivation. If motivation is increased then there will be an increase in performance. The second hypothesis states that the child is not familiar enough with the material to be able to do it. The child needs more practice and with more practice will come improvement. Hypothesis three states that insufficient instruction is what has led the child into academic deficiency. With increased instruction will come improvement. Hypothesis four states that instructional tasks and materials do not productively assist the student in learning. With the proper change in materials, improved performance will occur. The final hypothesis (number five) states that curriculum materials are not adequate for the student’s abilities. With materials properly matched to the student’s abilities, increased performance will occur (Daly et al., 1997).
Succeeding the development of the brief assessment model, research has confirmed Daly et al.’s initial hypotheses and has shown that the brief assessment is able to isolate a single, most effective intervention strategy for each child (e.g., Jones & Wickstrom, 2002; Jones, Harmon & Wickstrom, 2001; Daly, Martens, Hamler, Dool & Eckert, 1999; Martens et al., 1999).

**Brief Assessment Research**

In 1999, Daly et al. conducted a brief experimental analysis of oral reading fluency with four students referred for reading difficulties. For all subjects, the researchers discovered that at least one treatment condition was found to be significant in improving reading fluency. Daly et al. voiced concern that though their research was able to determine a most effective intervention strategy for each child, an extended analysis was necessary to determine whether the efficacy of the intervention continued to be empirically seen across continued treatment.

In 2001, Noell, Freeland, Witt, and Gansle conducted a brief assessment with an extended analysis on the reading-decoding skills of four students referred for poor academic performance. Their brief assessment consisted of three phases: baseline and two intervention conditions. A total of 12 brief assessments on the four students were performed. A 20% or greater increase over baseline was the criteria set for effectiveness. Ten of the 12 brief assessments were found to be successful in identifying one or both of the interventions as effective. An extended analysis of the same students showed 83% of the interventions to have the same effective or ineffective classification as they did in the original brief analysis.

In 2001, Jones et al. conducted a brief experimental analysis with five children on the treatment effects of three conditions and their effects on reading performance. The researchers immediately followed this study with an extended analysis of the same variables. The experimental analysis clearly identified a most effective treatment strategy in all cases. For each of the five children, the results were successfully confirmed in the extended analysis. Several methodological limitations, such as repetition of the same reading passages, were concluded with this research and offered direction for future studies.

In 2002, Jones and Wickstrom addressed the limitations from Jones et al.’s previous study and conducted a brief experimental analysis of four instructional strategies with five children who were referred for remedial reading services. Their brief assessment was successful in isolating a single, most effective strategy for each of the five children. For four of the five
children, the effects of the isolated strategy were examined in an extended analysis and were found to be consistent over the course of approximately 10 to 20 sessions.

**Reading Acquisition**

Previous studies conducted by the National Reading Panel (2003) identified oral reading fluency and phonological awareness as key skills for reading acquisition. The Instructional Hierarchy, derived by Haring, Lovitt, Eaton, & Hanson’s in 1978, offers educators a framework for understanding the stages through which students pass as they achieve new skills that are fundamental to successful reading. Haring et al.’s (1978) Instructional Hierarchy identified four major academic levels: Acquisition, Fluency, Generalization, and Adaptation. Acquisition is defined as, “the period between the first appearance of the desired behavior and the reasonably accurate performance of that behavior” (Haring et al., 1978, p.25). Once Acquisition has occurred, the skill must be performed proficiently. The student then needs to generalize what they have learned across environments different than that in which they mastered the skill. Finally, adaptation will be achieved when the student can modify the newly acquired skill so as to meet novel demands placed upon them (Daly, Lentz, & Boyer, 1996). The true strength of the Instructional Hierarchy is evident when instruction and intervention is formulated in response to the Instruction Hierarchy level at which the student is currently functioning.

**Reading Fluency**

Since the early 1980’s researchers have been studying the validity of Curriculum-Based Measures (CBM) reading fluency as an indicator of reading achievement. The findings suggest that oral reading fluency is one of the most valid and reliable measures of a student’s overall basic reading skills (Deno, Mirkin, & Chiang, 1982; Fuchs, Fuchs, & Maxwell, 1988). In a 1988 study by Fuchs et al., student’s reading fluency skills were compared to overall student performance on the reading portions of a leading standardized achievement test, the Stanford Achievement Test (SAT). The study found that CBM reading fluency correlated with the results of the SAT at r=.91, suggesting a very strong relationship between reading fluency and a student’s overall basic reading skills. Additionally, the r=.91 correlation was, in fact, the most highly correlated method of measuring overall reading skills found in the study. There is little doubt that reading fluency is critical for reading comprehension (Jager-Adams, 1990).
Progress Monitoring

Once a student’s academic skills have been measured, it is essential to monitor the changes, or lack of, that are occurring in their performance. Two types of progress monitoring are relevant in academic assessment and intervention: short-term progress monitoring and long-term progress monitoring (Shapiro, 1996). According to Shapiro (1996), both short and long-term progress monitoring are essential in obtaining the most complete evaluation of a student’s progress. Short-term progress monitoring allows us to identify successful and unsuccessful interventions by way of looking at immediate, or short-term, results. With short-term progress monitoring researchers are able to adapt, change, or continue interventions based on “decision rules.” Decision rules are established standards that guide evaluators in the analysis of whether a student is making acceptable progress towards the predetermined goal. Data collected during progress monitoring are analyzed in light of these decision rules. Long-term progress monitoring is for the purpose of determining whether the treatment, or intervention, has been successful in achieving the student’s long-term goal previously set by the examiner.

Purpose of Study

Though the brief assessment model using CBM has offered school psychologists and special educators a new direction in psycho-educational assessment and intervention, a number of questions are still left to be answered. Thus far, the treatment conditions in research have been shown to empirically improve academic performance, yet there has not been any research on the implementation of progress monitoring rules in the extended analysis that would assist in decision-making. In this study, “progress monitoring” rules were used to weekly or bi-weekly evaluate the student’s progress, while keeping careful data-records of the student’s improvement, or lack of. It was anticipated that these rules would assist us in discovering quantitatively the best intervention or combination of interventions, which would lead to the student’s greatest measurable academic achievement. Finally, this study examined the relationship between the immediate effects of intervention on student reading fluency, as measured by correct words per minute, and the generalized effects. Immediate effects represented the instant increase in reading performance following intervention implementation, whereas generalized effects represented the gradual and ongoing increase in reading over time.

More specifically, the research questions in this study included: 1) Were gains in student oral reading fluency evident during the tutoring program?, 2) Did the implementation of progress
monitoring rules lead to more effective treatment conditions?, and 3) What was the relationship between the immediate effects of intervention on student’s reading fluency and generalized effects?

METHOD

Setting
This research took place in the Fairfield City School District, a suburban public school district in southwestern Ohio. An elementary school located in this district, Fairfield South Elementary School, was the main venue for conducting this research. Enrollment for Fairfield South Elementary during the 2003-2004 school year was 500 students. 84.4% of the students in this school were of a Caucasian origin. 8.9% were African American and 4.1% were Multiracial. 14.1% of the student population at Fairfield South Elementary was economically disadvantaged (Ohio Department of Education, 2005).

Participants
Five third grade students, one male and four female, enrolled at Fairfield South Elementary School were included in this study. The average age of student participants was eight years old. Four of the students were Caucasian and one student was African American. With the exception of Title I resource room services that were being received by all research participants, the students were educated in the regular education classroom. Each student was identified as having a reading deficit which placed him or her significantly below peers and school norms. These deficits were found during an annual school-wide screening assessment. These data were provided to the experimenter conducting this research by the Fairfield South Elementary principal and school psychologist. In order to participate in this research, all participants had consent forms signed by their parents/legal guardians (see Appendix A). Verbal assent was also given by each participating student.

Examiners
In addition to the experimenter conducting this research, there were two additional second year Miami University school psychology graduate students acting as examiners. In total, there were three examiners whose roles were to perform the actual assessment and interventions with each child. Examiners also collected data and reviewed data collected by other examiners for the purpose of calculating inter-observer agreement. All examiners were trained in assessment and intervention procedures and best practices in research through Miami
University graduate courses EDP611 and EDP612. Additional training sessions specific to this research occurred at Fairfield South Elementary, while weekly or bi-monthly training, review, and debriefing meetings with the research team were held at Miami University.

Materials

Students who participated in this study were assessed on reading passages that were selected from several grade level reading curriculums. All passages were analyzed using the Fry (1968) readability formula to ensure appropriate readability level. The Fry readability formula is a commonly accepted formula used to calculate the readability level of a passage (Shapiro, 1996). It is based on the number of syllables and sentences per 100 words in a passage. All passages were formatted so that they were uniform in appearance, font size-15 Times New Roman, and double spaced standard paragraph. Approximately thirty-five passages were selected in accordance with the stated criteria and approximately 350 total copies of the passages were made (10 copies of each passage). For each passage there was a student copy and an identical examiner copy with a cumulative count of words per each line listed. See Appendix B for an example of student and examiner passage copies.

Tape recorders, blank 90-minute cassette tapes, and fidelity checklists were used to ensure examiner fidelity of procedures. See Appendix C for an example of fidelity checklists. An empty classroom was provided by Fairfield South Elementary where the actual assessments and tutoring took place. A stopwatch was used for keeping time. The only other materials used included picture coupons and small toy/trinket-like reinforcers, such as novelty pencil erasers or bouncy balls. These items were used to fulfill the incentive condition requirements of the Brief Assessment.

Dependent Variables

There were two dependent variables for this experiment: general correct words per minute and immediate correct words per minute (CWPM). The general CWPM score was the amount of correct words per minute the student read during the first reading of the treatment condition. This score represented the amount of correct words that a student read in a one-minute timing before any intervention was given to the student. Growth in oral reading fluency overtime was represented by the general score. The immediate CWPM score was the number of correct words per minute the student read during their final reading of the treatment condition. For every treatment condition being administered, a general CWPM score and an immediate
CWPM score were recorded. A word counts as a CWPM if it was properly read within three seconds. A word that was not mispronounced, substituted for, or omitted constitutes a properly read word.

Procedures

Procedures for this research were broken down into five phases.

Phase I

Phase I was composed of three steps and was devoted entirely to problem identification.

Step I. During the first step of Phase I, each student’s reading teacher was interviewed. It was within this interview that teachers completed a standardized teacher interview form (see Appendix D). This form documented the teacher’s perceptions of the child in the areas of reading, writing, math, academic engagement, disruptive classroom behavior, and critical social abilities. Questions probing the teacher’s perception of the child’s motivation, skill fluency, and skill acquisition abilities were also asked. It was also during this interview that goals, procedures, observations, and teacher updates were explained and/or clarified with the teacher. In all cases, step I took approximately 30 minutes to complete.

Step II. During step II, the child’s performance was evaluated and compared to peers through the administration of class/school-wide CBM norms in reading, math, and written expression. These norms were collected at Fairfield Elementary as part of an independent school-wide initiative, not related to this research. Data from these norms were provided to the researcher by the school principal and school psychologist. A comparative social measure was performed using a standardized Behavioral Observation System (B.O.S.; Jones, Wickstrom & Friman, 1997) during the child’s reading time (See Appendix E). More specifically, this instrument utilized an observational code that quickly and unobtrusively gathered data and provided details regarding the students on-and-off task behavior. In all cases, the B.O.S. was conducted for 30 minutes during a time of direct instruction in reading.

Step III. The final step of phase 1, was to establish a stable baseline. Baseline was a condition where no treatment was provided. Each student received two 30-minute sessions per week. During each 30-minute session, examiners administered a total of six CBM passages. A single passage was placed in front of the student and the student was instructed to read, according to script (see Appendix F). The child then read the passage for one minute. The researcher recorded the amount of correct words per minute (CWPM) and also errors per minute
(EPM) that the student read during the one minute passage administration. CWPM were the numerical amount of words the student read correctly in the one minute timing. EPM were the numerical amount of words the student misread during the one minute timing. This procedure was then repeated for a total of three passages. The median of the three passages was used for progress monitoring. A short break was then offered to the student and the procedure repeated itself with the last three passages. This was done in order to achieve the criteria of a “stable” baseline. A stable baseline was defined as a baseline in which: a) the variability of data was less than 20% (i.e., the difference between the lowest and highest baseline points is less than 20%) and b) the data do not show an upward trend (i.e., three successive data points in an upward direction; Alberto & Troutman, 2003). Examiners continued administration of probes in following sessions until a stable baseline was established. Once this baseline was established, the student was moved into Phase II. All sessions were recorded by the examiner with an audio cassette recorder for the purpose of determining inter-observer agreement of reading passages. Additionally, examiners completed fidelity checklists (see Appendix C) on a continuous basis in order to ensure uniform adherence to all procedures.

Phase II

Phase II was the problem analysis stage of the research. The goal of phase II was to determine which treatment condition was the most effective. It was here that a brief experimental analysis of oral reading fluency took place. Four treatment conditions were administered in the following order (from least intrusive to most intrusive): Incentive (IN), Repeated Reading (RR), Listening Passage Preview/Phrase Drill (PD), and Easier Material (EM). IN and RR were administered during one session. PD and EM were administered during the following session.

Incentive. In this condition the student was presented a choice of reinforcers or incentives with which they were rewarded if they achieved a predetermined goal. To begin the incentive condition, a numerical goal was determined based on the student’s baseline median. The goal was set at 30% above the baseline median score of correct words per minute. Three coupons were then placed in front of the child and the student was asked to pick one of the three that he/she wanted to try and earn. On each coupon was a different picture that represented a reward that the student could claim if the goal of CWPM was reached. The first coupon, the phone coupon, had a telephone picture on it and allowed the examiner to make an immediate and
positive phone call home to tell a parent or guardian how well their child did in achieving their reading goal. The second coupon, the prize coupon, had a picture of a toy on it and allowed the student to choose from a goodie bag of tangible reinforcers such as novelty erasers or trinkets. The third coupon, the award coupon, had a picture of a prize ribbon on it and could be exchanged for an achievement marker, such as a certificate or badge of accomplishment. It was then explained that if the predetermined goal was reached, they would win the reward. A CBM passage was then placed in front of the student and they read for one minute. If the goal was achieved, the reward was provided. If the goal was not reached, the student was then provided with encouragement and a consolation reward, such as a small sticker. CWPM and errors were recorded by the examiner. The purpose of the incentive condition was to assess if motivation was a factor in the student’s academic deficiency. This treatment condition was premised under the hypothesis that the student was not motivated to respond to the instructional demands placed upon him/her (Daly et al., 1997). Research has empirically supported the use of incentives to increase reading performance (e.g., Seybert, Dunlap & Ferro, 1996; Dunlap, et al., 1994; Aylon & Roberts, 1974; Lovitt, Eaton, Kirkwood & Pelander, 1971).

Repeated Reading. In this condition a student received extra practice in reading a particular passage. To begin, the student was given a CBM passage and instructed to read the passage aloud. This was repeated until the child had read the passage four times. On the fourth reading, CWPM and errors were recorded by the examiner. The purpose of the Repeated Reading condition was to assess if the student has had a sufficient amount of practice time in reading. This treatment condition was premised under the hypothesis that the student needed more practice in order to improve (Daly, Martens, Kilmer & Massie, 1996). Research has empirically supported the use of repeated readings to increase reading performance (e.g., Daly et al., 1997)

Listening Passage Preview/Phrase Drill. In this condition a student was able to listen to a passage being read aloud to them, then read the same passage and was given practice with any words which caused them difficulties. To begin, a student was given a copy of a CBM passage. The examiner then orally read from his/her own copy of the passage while the student followed along. The student read the same passage aloud while the examiner highlighted on his/her own copy any words that the student had difficulty with (maximum of 15 words). All highlighted words were then reviewed in the following manner: a) the examiner read each missed word to
the student and b) the examiner then had the student read short phrases from the story that contained the problematic word. Each short phrase was repeated three times by the student while the examiner immediately corrected any errors. The student then read from the same passage again for one minute; CWPM and errors were recorded by the examiner. The purpose of the listening passage preview/phrase drill condition was to assess if the student needed more instruction. This treatment condition was premised under the hypothesis that the student needed more instruction in order to improve (Daly et al., 1997). Research has empirically supported the use of listening passage preview/phrase drill to increase reading performance (e.g., Daly et al., 1997).

_Easier Material._ In this condition a student read from a passage that was determined to be one grade level below their current level of instruction (e.g., a student currently reading in third grade curriculum was given a second grade curriculum passage to read). The student read from this passage for one minute; CWPM and errors were then recorded by the examiner. No instructional support or reinforcement was provided. The purpose of the easier material condition was to determine if reading material was at an instructional level too difficult for the student. This treatment condition was premised under the hypothesis that the student’s skill level was poorly matched to the instructional level of the reading material (Daly et al., 1997). Research has empirically supported the use of easier material to increase reading performance (e.g., Daly et al., 1996; Gickling & Armstrong, 1978).

Phase II did not conclude until a most effective treatment condition was replicated. A 30% criteria, meaning 30% or more over baseline, for evaluating treatment effectiveness was used. Previous research has used varying criteria levels (e.g., 20-40%). Before a condition could be replicated, a “mini-withdrawal” was needed in order to eliminate the possibility of measurement and practice effects (Martens et al., 1999). A mini-withdrawal required that the most effective treatment strategy be replicated following a “reversal.” A reversal occurred when any administered condition, following the most effective treatment strategy, caused a regression in CWPM towards the baseline median. It many cases the reversal did occur during the natural course of phase II treatment condition administration (i.e., Easier Materiel). When that happened, the most effective strategy was then administered once again. If a reversal did not naturally occur, then the examiner administered the least effective condition (e.g., baseline) followed by the most effective treatment condition. Fidelity checklists for all treatment
conditions of phase II were completed by examiners. On average, phase II lasted one-two weeks in duration.

Phase III

The purpose of phase III was to determine the treatment strength for each case. The objective of this phase was to administer the most effective single treatment condition (found in phase II) as many times as possible during the course of each 30-minute session. Examiners met with the child twice per week.

Examiners tracked and graphed each immediate CWPM score. The immediate CWPM score was defined as the number of CWPM the student read during their final reading. These were used in the monitoring of the student’s short-term growth/improvement.

In order to identify the strength of treatment that was necessary to best serve each student, the examiner determined whether the median of the last three immediate CWPM was above the literature-based standard of 100CWPM for third and fourth grade students (Fuchs & Demo, 1982). If the median was above this criteria, then treatment moved to phase IV (treatment evaluation). If the median was not above the set criteria, then the least intrusive treatment condition not yet being used (e.g., IN, RR, PD, or EM) was added to the most effective treatment condition. This continued until the least amount of treatment necessary was found that would increase the immediate performance levels to satisfy the literature-based standard. On average, phase III lasted between one and three weeks in duration.

Phase IV

Phase IV was the evaluation of treatment in terms of the general effects. It was during this phase that examiners continued tutoring visits twice per week and administered as many most-effective treatment conditions (a single treatment condition possibly included two or more intervention strategies) as possible during the course of each session. An aimline for measurement of the student’s long-term progress was implemented. The aimline was a graphic representation of the desired slope of improvement, or theoretical progress, that the student was expected to make during the course of treatment. The aimline was drawn from the median of the final three general CWPM data points of phase III, to the set goal the student was expected to reach before termination of treatment. In the case of this research, this goal was set 16 weeks (duration of treatment) from the initial treatment session and was calculated using the average expected growth rate in oral reading fluency across one year. This goal was determined by
adding +1 CWPM/week for grades 3-4, +1.5 CWPM/week for grade 2, and +2 CWPM/week for grade 1, to each week of intervention (Fuchs, Fuchs, Hamlett, Walz & Germann, 1993). Graphing of general CWPM scores continued and was used to examine progress in order to evaluate the necessary treatment duration. A three-point decision rule was used to evaluate progress in relation to the aimline (Shapiro, 1996). More specifically if three consecutive data points fell below the aimline, an additional treatment strategy or an additional weekly tutoring session for a total of three/week was added.

Phase V

Phase V was follow up. At this point, comprehensive reports, presenting tutoring results and findings, were delivered to the school and parents during a final meeting.

Research Design

A single subject multi-element design was used to investigate the effects of a brief assessment on oral reading fluency. Four intervention conditions were used, they were: Incentive; Repeated Reading; Listening Passage Preview/Phrase Drill; Easier Material. These interventions were also presented in a hierarchical order, from least intrusive to most intrusive. An extended analysis, implementing progress monitoring rules, examined the effectiveness and reliability of individualized intervention packages. These packages were developed by way of the brief assessment results.

Interrater Agreement & Treatment Fidelity

99% of all sessions were recorded on audiotape by researchers. 38% of these sessions were listened to and scored by an independent-rater on correct words per minute (CWPM). CWPM Interrater agreement averaged 98% among the five cases with a range of 98% to 99%. To ensure adherence to procedures, examiners completed a fidelity checklist (see Appendix C) for every intervention condition that was administered. Fidelity checklist interrater agreement averaged 100%.

RESULTS

The results of each of the five cases in this study were examined in order of the Problem Identification, Problem Analysis, and Treatment Evaluation phases of research.

Problem Identification

*Figure 1* displays the results of the Problem Identification phase (phase 1) for each of the five cases.
Reading

As illustrated in Figure 1, based on the administered school-wide reading probes, Cases 1 through 5 were found to be significantly behind peers in reading. Grade-level benchmarks, in accordance with the literature based standards (Fuchs & Deno, 1982), were set at 100 CWPM. The median score for Case 1 was 58 CWPM, Case 2 read 48 CWPM, Case 3 read 44 CWPM, Case 4 read 64 CWPM, and Case 5 read 62 CWPM.

Written Expression

The five cases participating in this study came from three different classrooms, therefore three different peers means are employed in analysis of the following written expression scores. As illustrated in Figure 1, grade-wide curriculum based measures in written expression yielded results that indicated Case 1 achieved 22 total words (TW) and case 2 achieved 27 TW on written expression probes, while their peer average was 33 TW. Case 3 achieved 33 TW and case 4 achieved 17 TW on written expression probes, while peers averaged 72 TW. Case 5 was commensurate with peers with a total word score of 33, while peers averaged 32 TW.

Mixed Math

As illustrated in Figure 1, Case 1 scored 5 digits correct (DC) on mixed math probes and Case 2 scored 2 DC on math probes. Case 3 and Case 5 attained scores of 10 DC and 2 DC respectively. Case 4 scored 18 DC on the probes, the only case to score above their peer average. The peer average for all third grade students, based on Fairfield South Elementary norms, was 15DC.

Social Component

The social component of the problem identification phase revealed all five cases to be at approximately the same level as that of peers. The greatest difference was in Case 1, where peers were on-task 87% of the time and Case 1 was on task 71% of the time. Case 2 was on-task 80%, while peers were on-task 86% of the time. Case 3 was on-task 83%, compared to peers at 77%. Case 4 was on-task 80% of the time, while peers were on-task 83% of the time. Case 5 was observed to be on-task 97% of the time, compared to peers who were also observed to be on-task 97% of the time.

Problem Identification results indicated that students selected for research had significant academic deficits in reading. The fact that all five cases were comparable to peers on the social
component of the problem identification indicated that a lack of attention during academic instructional time was not a concern.

Baseline

The established baseline results for cases 1 through 5 are illustrated in Figure 2. The baseline results, reflecting the median score of CWPM, were: Case 1 read 59 CWPM, Case 2 read 40 CWPM, Case 3 read 44 CWPM, Case 4 read 80 CWPM, and Case 5 read 62 CWPM.

Problem Analysis and Treatment Strength

Following baseline, the brief experimental analysis produced a single, most effective, intervention strategy for each case participant. Treatment strength was then determined.

The results of the brief experimental analysis are illustrated in Figure 3.

Case 1

Case 1 read 59 CWPM in the baseline condition. In the IN condition, Case 1 read 90 CWPM. In the RR condition Case 1’s performance increased to 128 CWPM. In the PD and EM conditions, Case 1’s performance decreased to 93 CWPM and 65 CWPM, respectively. The EM condition satisfied the criteria for the reversal. The IN condition satisfied the 30% over baseline criteria, but did not replicate. Therefore, RR was implemented again and replicated at 111 CWPM. This satisfied the criteria for using RR in determining treatment strength. Figure 4.1 displays the results for determining treatment strength. In order for the median of the last three data points to exceed the literature-based criteria of 100 CWPM, it was necessary for Case 1 to receive the combined interventions of RR and IN to satisfy this criteria.

Case 2

Case 2 read 40 CWPM in the baseline condition. In the IN condition, Case 2 also read 40 CWPM. In the RR condition Case 2’s read 58 CWPM. In the PD condition, Case 2’s fluency score increased to 78 CWPM. In the EM condition, Case 2’s performance decreased to 41 CWPM and satisfied the criteria for the reversal. RR results were replicated at 76 CWPM and therefore satisfied the criteria for using RR in determining treatment strength. Figure 4.1 displays the results for determining treatment strength. In order for the median of the last three data points to exceed the literature-based criteria of 100 CWPM, it was necessary for Case 2 to receive the combined interventions of RR, IN, and PD to satisfy this criteria.
Case 3

Case 3 read 44 CWPM in the baseline condition. In the IN condition, Case 3 increased to 62 CWPM. In the RR condition Case 3’s performance had a slight increase over baseline to 53 CWPM. In the PD condition, Case 3’s fluency score rose to 82 CWPM. The EM condition produced only 35 CWPM with Case 3 and satisfied the criteria for the reversal. Case 3’s reading fluency was highest in the PD condition at 82 CWPM. The PD results replicated at 83 CWPM and therefore satisfied the criteria for using PD in determining treatment strength. Figure 4.2 displays the results for determining treatment strength. In order for the median of the last three data points to exceed the literature-based criteria of 100 CWPM, it was necessary for Case 3 to receive the combined interventions of PD, IN, and RR to satisfy this criteria.

Case 4

Case 4 read 80 CWPM in the baseline condition. In the IN condition, Case 4 increased to 92 CWPM. The RR condition brought about an increase in Case 4’s fluency score to 129 CWPM. In the PD condition, Case 4’s score was 116 CWPM. The EM condition produced 102 CWPM and satisfied the criteria for the reversal. Case 4’s reading fluency was highest in the RR condition at 129 CWPM. The RR replication results decreased to 94 CWPM. This decrease in fluency did not satisfy the criteria for using RR in determining treatment strength. Since the results for RR were unsatisfactory, the condition that produced the second highest increase in Case 4’s fluency score, PD at 116 CWPM was then used in attempt to replicate brief assessment results. PD results increased to 136 CWPM and therefore satisfied the criteria for using PD in determining treatment strength. Figure 4.2 displays the results for determining treatment strength. In order for the median of the last three data points to exceed the literature-based criteria of 100 CWPM, it was only necessary for Case 3 to receive the intervention condition of PD to satisfy this criteria.

Case 5

Case 5 read 62 CWPM in the baseline condition. In the IN condition, Case 5 read 72 CWPM. In the RR and PD condition, Case 5’s performance increased to 86 CWPM and 107 CWPM, respectively. The EM condition produced 76 CWPM. Since no condition satisfied the reversal criteria of 30% below the desired intervention condition, a BL passage, void of intervention, was implemented. BL results, at 74 CWPM, satisfied reversal criteria. RR results, at 82 CWPM, did not satisfy replication criteria. Case 5’s reading fluency was highest in the PD
condition at 107 CWPM. The PD results replicated at 88 CWPM and therefore satisfied the criteria for using PD in determining treatment strength. Figure 4.3 displays the results for determining treatment strength. In order for the median of the last three data points to exceed the literature-based criteria of 100 CWPM, it was necessary for Case 5 to receive the combined interventions of PD, RR, and IN to satisfy this criteria.

Treatment Strength Summary

Four of the five cases in this study required a treatment package of combined interventions to satisfy the treatment strength criteria of at least 100 CWPM. Three of the cases, Case 2, Case 3, and Case 5, each required the full, most intensive, treatment package of RR, IN, and PD to satisfy treatment strength criteria. Case 1 only required the combined intervention conditions of RR and IN to satisfy the criteria. Case 4, being the only case to require a sole intervention condition, needed only PD to satisfy the treatment strength criteria.

Treatment Evaluation

Treatment evaluation results are displayed in Figure 5. All cases, unless otherwise noted utilized the two sessions per week model of intervention during treatment evaluation.

Case 1

During the determination of treatment strength in the Problem Analysis phase of research, Case 1 was found to have a median general fluency score of 62 CWPM. Therefore Case 1’s aimline was set at 78 CWPM by the end of the 16th week of intervention. Since Case 1 was only able to participate in 15 weeks of intervention, Case 1’s aimline was adjusted to 77 CWPM by the end of the 15th week. At the end of the 15th week of intervention, 100% of Case 1’s weekly general median scores were above the projected aimline. Case 1’s highest general median fluency score was 86 CWPM at week 13. Case 1’s lowest general median fluency score was 70 CWPM at week 5. A visual analysis of Case 1’s weekly medians, as displayed in Figure 5.1, indicated that over the course of the fifteen weeks of intervention, Case 1 made consistent progress that tracked and surpassed the aimline projection. Immediately following the 15th week of intervention, Case 1 participated in an additional two weeks of progress monitoring. During this time, no intervention was provided. Case 1’s median of weekly fluency progress monitoring scores, during this time was 92 CWPM.
Case 2

During the determination of treatment strength in the Problem Analysis phase of research, Case 2 was found to have a median general fluency score of 48 CWPM. Therefore Case 2’s aimline was set at 64 CWPM by the end of the 16th week of intervention. Since Case 2 was only able to participate in nine weeks of intervention, Case 2’s aimline was adjusted to 57 CWPM by the end of the ninth week. At the end of the ninth week of intervention, 56% of Case 2’s weekly general median scores were above the projected aimline. Case 2’s highest general median fluency score was 67 CWPM at week 8. Case 2’s lowest general median fluency score was 35 CWPM at week 2. A visual analysis of Case 2’s weekly medians, as displayed in Figure 5.1, indicated that over the course of the nine weeks of intervention, Case 2 made consistent progress that either tracked or surpassed the aimline projection.

Case 3

During the determination of treatment strength in the Problem Analysis phase of research, Case 3 was found to have a median general fluency score of 52 CWPM. Therefore Case 3’s aimline was set at 68 CWPM by the end of the 16th week of intervention. Since Case 3 was only able to participate in 10 weeks of intervention, Case 3’s aimline was adjusted to 62 CWPM by the end of the 10th week. At the end of the 10th week of intervention, 70% of Case 3’s weekly general median scores were above the projected aimline. Case 3’s highest general median fluency score was 75 CWPM at weeks four, eight, and eleven. Case 3’s lowest general median fluency score was 47 CWPM at week 2. A visual analysis of Case 3’s weekly medians, as displayed in Figure 5.2, indicated that over the course of the ten weeks of intervention, Case 3 made consistent progress that tracked and surpassed the aimline projection. Immediately following the 10th week of intervention, Case 3 participated in an additional two weeks of progress monitoring, where all intervention was withdrawn. Case 3’s median of weekly fluency progress monitoring scores during these two weeks was 70 CWPM.

Case 4

During the determination of treatment strength in the Problem Analysis phase of research, Case 4 was found to have a median general fluency score of 75 CWPM. Therefore Case 4’s aimline was set at 91 CWPM by the end of the 16th week of intervention. Since Case 4 was only able to receive eight weeks of intervention, Case 4’s aimline was adjusted to 83 CWPM by the end of the eighth week. At the end of the eighth week of intervention, 75% of
Case 4’s weekly general median scores were above the projected aimline. Case 4’s highest general median fluency score was 90 CWPM at week five. Case 4’s lowest general median fluency score was 68 CWPM at week three. A visual analysis of Case 4’s weekly medians, as displayed in Figure 5.2, indicated that over the course of the eight weeks of intervention, Case 4 made consistent progress that tracked and surpassed the aimline projection. Immediately following the eighth week of intervention, Case 4 participated in one additional week of progress monitoring, where all intervention was withdrawn. Case 4’s median of weekly fluency progress monitoring scores during this final week was 92 CWPM.

Case 5

During the determination of treatment strength in the Problem Analysis phase of research, Case 5 was found to have a median general fluency score of 60 CWPM. Therefore Case 5’s aimline was set at 76 CWPM by the end of the 16th week of intervention. Since Case 5 was only able to participate in 13 weeks of intervention, Case 5’s aimline was adjusted to 73 CWPM by the end of the 13th week. At the end of the 8th week of intervention, 13% of Case 1’s weekly general median scores were above the projected aimline. Case 5’s highest general median fluency score was 69 CWPM at week 4. Case 5’s lowest general median fluency score was 34 CWPM at week two. It was during the eighth week of intervention that Case 5 was found necessary to increase the intensity of provided intervention by adding an additional tutoring session, from two sessions per week to three sessions per week. After this increase in weekly tutoring sessions was introduced, Case 5’s weekly general median scores improved to 40% above aimline projections. Case 5’s two highest weekly general median scores, of 83 CWPM and 92 CWPM, also came after the decision was made to increase to three sessions per week. A visual analysis of Case 5’s weekly medians, as displayed in Figure 5.3, indicated that over the course of the fifteen weeks of intervention, Case 5 did make progress, but was consistently below the projected aimline. Case 5 was the only case in this research study that did not outperform their projected aimline. Case 5 also represents the only case in this project that required an increase in treatment intensity during the treatment evaluation phase. All of the median fluency scores achieved by Case 5 during this three sessions per week period, were higher than 75% of the general median fluency scores obtained when Case 5 was only receiving two sessions per week.
Immediate and General Effects of Intervention

Immediate and general effects of intervention are displayed in Figure 6. The immediate and general effects of intervention were found to have a moderate relationship ($r=.48$ to $r=.62$). Cases 2, Case 3, and Case 5 had the highest relationship between immediate and general effects at $r=.54$, $r=.62$, and $r=.62$, respectively. The immediate and general effects of Case 1 and Case 4 were found to have moderate relationships at $r=.53$ and $r=.48$, respectively. The median of the five cases was $r=.54$ and the mode was $r=.62$.

Interpretation of Trends

Quarter-intersect analysis of the data collected over the course of the Treatment Evaluation phase indicate increasing trends for all five case participants. Median scores for Case 1 were 74 and 82 CWPM, Case 2 were 46 and 60 CWPM, Case 3 were 51 and 73 CWPM, Case 4 were 77 and 88 CWPM, and Case 5 were 53 and 65 CWPM.

DISCUSSION

This research study examined the efficacy of a hierarchical assessment model that directly linked evidence-based assessment in oral reading fluency to intervention. An extended analysis, that implemented progress monitoring decision rules with five academically at-risk elementary-aged students, was used to examine the relationship between the immediate and generalized effects of intervention outcomes.

In summary, of the three active phases of research, the Problem Identification phase was successful in identifying academically at-risk children. All subjects who were identified as at-risk during the Problem Identification were also found to be at risk during the initial baseline measurements of oral reading fluency. This suggests that students identified as at-risk during school-wide screening procedures are very likely to also be identified at-risk in reading, hence being excellent candidates for intervention in reading. The Problem Analysis phase of research was successful for all five cases in determining the most effective, yet least intrusive, intervention package that maximized oral reading fluency performance. Repeated Reading (RR) and Listening Passage Preview/Phrase Drill (PD) were initially the most-effective intervention strategies for 100% of case participants. Four of the five cases required a combination of interventions to satisfy treatment strength criteria. Of those four cases, three required the most intensive intervention package of RR, Incentive (IN), and PD. One case required RR and IN and one case only required the sole intervention of PD to meet the treatment strength criteria of 100
correct words per minute (CWPM). Intervention packages were progress monitored during the Treatment Evaluation phase of research and were found to be successful in increasing all student participants oral reading fluency scores along their individualized projected aimlines (Figure 5).

Were gains in student oral reading fluency evident during the tutoring program (research question #1)? At the conclusion of research, each of the five case participants in this study were found to make gains over their pre-intervention performance in oral reading fluency, that ranged from 9%-59% (based on the mean of each cases’ last three general weekly medians) (Figure 5). These findings were consistent with outcomes from previous studies that incorporated brief and extended analysis (Jones & Wickstrom, 2002; Jones et al., 2001; Noell et al., 2001) of oral reading fluency, hence suggesting reliability of effects.

Progress monitoring decision rules, implemented in the Treatment Strength and Treatment Evaluation phases of research allowed for a standardized set of procedures to guide treatment decisions. More specifically, the three-point decision rule provided researchers a criteria for tracking Cases 1 through Case 5’s weekly progress against individualized aimlines (Shapiro, 1996), ensuring that the most profitable, yet least intrusive, intervention intensity was being implemented. In four of the five cases, only two tutoring sessions per week were necessary to bring about progress that either tracked or surpassed each student’s projected aimline. In only one case was it necessary for the student to increase their amount of weekly tutoring sessions in order to successfully track aimline progress.

Did the implementation of progress monitoring rules lead to more effective treatment conditions (research question #2)? Although progress monitoring rules were successful in guiding researchers during the Treatment Evaluation phase, the three-point decision rule was not employed identical to what was originally proposed. Though the deviation from the original proposal was slight, it represents a strength and weakness of this research study. Case 3 and Case 5 are the best examples of what is meant by this. Case 3’s initial three progress monitoring data points collected during the Treatment Evaluation phase were 51, 47, and 49 CWPM. Case 3’s median baseline point, determined during the Problem Analysis phase, was 52 CWPM. It is this baseline point that the aimline is drawn from. According to the 3-point decision rule, Case 3 should have immediately increased treatment evaluation strength to three tutoring sessions per week as soon as the third consecutive weekly median data point fell below the projected aimline. Since these three data points only deviated a slight degree from the aimline and it was so early in
the Treatment Evaluation phase, a team decision was made to wait one more week to collect a fourth median point in order to make the best possible decision. The fourth data point was in fact 34% over baseline, and all subsequent weekly medians, for all weeks to come, surpassed aimline expectations. Therefore, although procedures deviated from what was proposed, the applied significance of using data and team input to make the best possible decision outweighed strict adherence to the decision rule in this case. The ability to be flexible during intervention and employ collaborative feedback for response guided experimentation (Barlow & Hersen, 1984) made intervention even more effective in the case of this student.

In Case 5, the decision to increase the student to three tutoring sessions per week was not made until the eighth week of the Treatment Evaluation phase. Although Case 5’s first three data points fell significantly below the projected aimline, the team decided to wait one more week and collect a fourth median point in order to make the best possible decision. During the fourth week, the weekly median data point surpassed the aimline and it was decided that Case 5 would continue on the two sessions per week model. Following this fourth data point, Case 5 had three more continuous data points that fell below the aimline. Upon examination by the team, these three data points were found to deviate only slightly from the aimline. Additionally, the three points were increasing in nature and the trend of the three points appeared to be on track to surpass the aimline by the next week. Again, a team decision was made to wait one more week to collect a fourth median point in order to make the best possible decision. This time, the weekly median fell below the aimline and the previous three consecutive medians. At this point, it was decided that Case 5 would increase intervention intensity by immediately moving to three tutoring sessions per week. Increasing to three sessions per week for Case 5 brought about an increase in Case 5’s weekly measured oral reading fluency performance.

What was the relationship between the immediate effects of intervention on student’s oral reading fluency and generalized effects (research question #3). In all five cases, a moderate relationship was found between the immediate and general effects of intervention (Figure 6). Correlation for the immediate and general effects among the five cases ranged from $r=.48$ to $r=.62$, with a median of $r=.54$ and a mode of $r=.62$. These results suggest that the procedures for determining intervention packages (i.e., Treatment Strength) were effective in finding intervention strategies or combinations of strategies that consistently made significant positive impacts on the oral reading fluency scores of case participants.
Data from the extended analysis that occurred during the Treatment Evaluation phase of research supports the use of the brief assessment as a model for identifying the most effective, yet least intrusive interventions for use in targeting oral reading fluency skills in at-risk students. For all cases, the proposed procedures and progress monitoring during the Problem Analysis and Treatment Evaluation phases of research lead to gains in oral reading fluency that met or surpassed literature-based standards for oral reading fluency acquisition. Meeting literature-based standards over a nine to fifteen week period may not seem impressive at first glance, as it is what is expected of most students; however, for the five cases who participated in this study it was the first time this school year, that they had made progress that was comparable and consistent to peers. The single-case design used in this research offers its users a framework for identifying and measuring the most effective, yet least intrusive intervention packages for improving students oral reading fluency skills in a time-efficient manner. A typical brief assessment was able to be completed in a timespan of 30 minutes to an hour. Subsequent determination of intervention packages (Problem Analysis) required a considerably greater amount of time in comparison with brief assessments.

Instructional Implications

When psychologists are spending more than 50% of their time engaged in assessment, the assessment methodologies and strategies that are being used must have the ability to inform and properly guide the educational decisions that need to made (Shapiro, 1996). Legislation such as Public Law 94-142 has redefined the role and function of the school psychologist from the days when the administration of criterion-referenced tests were the status quo, no matter what the reason for referral. Assessment methodologies that directly assess student performance, while producing defensible data sets for use in academic decision making processes, are required by today’s contemporary school psychologist. Salvia and Ysseldyke (1995) suggested that assessment data must be able to answer questions of referral, screening, classification, instructional planning, and progress monitoring. The five phase model presented and implemented in this research offers school psychologists a detailed diagnostic and intervention tool that is an answer to those questions, especially as they relate to overall basic reading skills. Sufficient research validates the importance of basic reading skills to the academic success of students (Deno, Mirkin, & Chiang, 1982; Fuchs, Fuchs, & Maxwell, 1988). The presented model is comprehensive in that it provides a way to identify at-risk students, individualize
intervention, determine the strength of intervention necessary to achieve calculated gains, and progress monitor student achievement.

Limitations

Despite a compilation of very positive results that support the use of the model proposed in this study, research did identify several limitations that should be noted. First, as with most intervention studies that take place with students during the academic school year, it is impossible to say all increases in oral reading fluency that occurred over the course of this study were solely due to the effects of interventions from this study. Student participants in this research were chosen because of their at-risk identification. Because of this, students were also receiving additional academic attention from teachers and others sources outside of the tutoring services provided by this research study. To determine the extent to which these additional aides influenced the results of this study is not within the scope of this research. Future research may find it beneficial to document what services, if any, a child is receiving prior to, as well as during, intervention.

Second, this research was not able to standardize the latency of tutoring sessions. It is possible that the amount of time that lapsed between tutoring sessions could have some effect on the student’s oral reading fluency acquisition rate. Although care was taken to ensure that students each received two tutoring sessions per week, and three when applicable, it was not possible for research to ensure all students received intervention on the same days with the same number of days between each session. Tutoring sessions were provided on the same days from week to week though.

Third, research only employed four interventions. Although these four interventions did accommodate Daly’s five hypothesis as to why students have difficulties learning (Daly et al., 1997), future research should be directed towards experimenting with other interventions that hold the potential for being even more effective in increasing a students oral reading fluency rate than the interventions used here.

Future Directions

Continued research efforts should focus on four particular areas of interest: Development of intervention packages, effectiveness of the three-point decision rule verses team decision, intervention choice, and the possibility for an alternate form of progress monitoring based on the calculated difference between a student’s immediate and general CWPM.
Intervention packages used in this study were created based on implementing intervention strategies, ordered according to intrusiveness, from the least intrusive to most intrusive. For example, once a most effective intervention was determined for a student, and it was found necessary to combine that intervention with another in order to satisfy the literature based criteria of 100 CWPM, the Incentive condition was consistently implemented. Incentive was chosen because it was the least intrusive intervention available. This decision, based on the intrusiveness of the intervention, ignored interventions that may have been more effective, but also more intrusive. Future research may weigh the benefits of implementing more intrusive interventions before less intrusive interventions if the more intrusive interventions proved to be more effective in increasing oral reading fluency during the Problem Analysis stage.

Throughout the course of this research, the three-point decision rule was supplemented on several occasions with a team decision that overrode the three-point decision rule. On some instances the team decision proved to be beneficial to the overall results of the case. On other instances, it could be argued that adhering to the three-point decision rule may have yielded better results. Future research may compare the results of two separate studies where intervention intensity is determined based upon team decision, while the other is based on strict adherence to the three-point decision rule.

Third, interventions used in this research were limited to four interventions that satisfied the criteria for each of Daly’s et al’s four hypotheses as to why students have difficulty learning. Future research may look for additional interventions that hold the potential to be more effective and efficient at producing increases in student’s oral reading fluency skills.

Finally, an analysis of the difference between a student’s first and final readings of a passage appears to hold potential as another possible way to progress monitor and project the rate of a student’s oral reading fluency growth. When the difference between a student’s first and final reading on a passage, during the first week of tutoring, is compared to the same difference calculated at several different points during the year, progress may be able to be monitored based on the resulting calculations.
REFERENCES


Problem Identification

Case 1

Case 2

Case 3

Case 4

Case 5

Legend

= Target Student

= Peer
Figure 2

Baseline of CWPM for Cases 1-5

Reading Baseline Medians for Cases 1-5

Correct Words per Minute (CWPM)

Case 1  Case 2  Case 3  Case 4  Case 5
Results of Brief Experimental Analysis

Figure 3
Figure 4.1

Results of Brief Experimental Analysis and Treatment Strength

Case 1

Case 2
Figure 4.2

Results of Brief Experimental Analysis and Treatment Strength

**Case 3**

**Case 4**
Figure 4.3

Results of Brief Experimental Analysis and Treatment Strength
Figure 5.1

Treatment Evaluation of General Weekly Median Scores with Aimline

**Case 1**

**Case 2**
Figure 5.2

Treatment Evaluation of General Weekly Median Scores with Aimline

Case 3

Case 4
Figure 5.3

Treatment Evaluation of General Weekly Median Scores with Aimline
Figure 6
Relationship Between Immediate and General CWPM for Individually Administered Passages

Case 1

$r = .53$

Case 2

$r = .54$

Case 3

$r = .62$

Case 4

$r = .48$

Case 5

$r = .62$
Appendix A

Consent

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/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’s 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 have any questions or concerns, or would like more information about the program, please contact your child’s teacher and/or the research team at Miami University:

Dr. Katherine Wickstrom, 513-529-6624           Amity Noltemeyer, M.S., 513-529-8069
Shelaina Brown, M.S., 513-529-8051           Jeffery Schuka, M.S., 513-529-8051

If you have any questions regarding your rights as a participant in this project, you may also contact the Office for the Advancement of Scholarship and Teaching (529-3734 or <humansubjects@muohio.edu>) at Miami University.

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

______________________________    __________________________
Signature                                          Date

______________________________
Child=s Full Name (please print)
Appendix B

Student Passage Example

Elephants eat between 250 and 350 pounds of food a day. They need a lot of food to run their large six-ton bodies. Because of that, they spend nineteen hours a day eating. They eat all types of plants. They eat by putting food into their mouths with their trunks. Their trunks act like a fork for eating food. They act like a straw for drinking water too. Their trunk can also be used in many other ways. An elephant can use its trunk like a tool. It can be used like an ax to break tree branches or as a weapon against predators such as lions. It can also be used as an arm to comfort a friend or hug a baby. Baby elephants even suck their trunks just like human babies such their thumbs.
Elephants eat between 250 and 350 pounds of food a day. They need a lot of food to run their large six-ton bodies. Because of that, they spend nineteen hours a day eating. They eat all types of plants. They eat by putting food into their mouths with their trunks. Their trunks act like a fork for eating food. They act like a straw for drinking water too. Their trunk can also be used in many other ways. An elephant can use its trunk like a tool. It can be used like an ax to break tree branches or as a weapon against predators such as lions. It can also be used as an arm to comfort a friend or hug a baby. Baby elephants even suck their trunks just like human babies such their thumbs.
Appendix C

Fidelity Checklist for
BASELINE

Baseline
Session No. _____  Date: _________________  Phase __________________
Selected passage. Code ___________  __Instructions
Assessed instructional performance  CWPM:_____  Errors _____  IOA: _______

Baseline
Session No. _____  Date: _________________  Phase __________________
Selected passage. Code ___________  __Instructions
Assessed instructional performance  CWPM:_____  Errors _____  IOA: _______

Baseline
Session No. _____  Date: _________________  Phase __________________
Selected passage. Code ___________  __Instructions
Assessed instructional performance  CWPM:_____  Errors _____  IOA: _______

Baseline
Session No. _____  Date: _________________  Phase __________________
Selected passage. Code ___________  __Instructions
Assessed instructional performance  CWPM:_____  Errors _____  IOA: _______

Baseline
Session No. _____  Date: _________________  Phase __________________
Selected passage. Code ___________  __Instructions
Assessed instructional performance  CWPM:_____  Errors _____  IOA: _______
Appendix C
Fidelity Checklist for BRIEF ASSESSMENT

**Incentive**

<table>
<thead>
<tr>
<th>Session No.</th>
<th>Date:</th>
<th>Phase:</th>
<th>Selected passage. Code:</th>
<th>Goal set: 1.30 X baseline median =</th>
<th>Reward coupon selected:</th>
<th>Instructions (make reference to goal)</th>
</tr>
</thead>
</table>

Assessed instructional performance  

<table>
<thead>
<tr>
<th>CWPM:</th>
<th>Errors:</th>
<th>IOA:</th>
</tr>
</thead>
</table>

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

**Repeated Reading**

<table>
<thead>
<tr>
<th>Session No.</th>
<th>Date:</th>
<th>Phase:</th>
<th>Selected passage. Code:</th>
<th>Student read instructional passage 3 times</th>
<th>Instructions</th>
</tr>
</thead>
</table>

Assessed instructional performance  

<table>
<thead>
<tr>
<th>CWPM:</th>
<th>Errors:</th>
<th>IOA:</th>
</tr>
</thead>
</table>

**LPP/Phrase Drill**

<table>
<thead>
<tr>
<th>Session No.</th>
<th>Date:</th>
<th>Phase:</th>
<th>Selected passage. Code:</th>
<th>Examiner read story once aloud while child follows along on copy.</th>
<th>Student read aloud passage while examiner highlighted errors</th>
<th>Student read phrase containing error three times each, with immediate correction MAX. 15 PHRASES</th>
</tr>
</thead>
</table>

Assessed instructional performance  

<table>
<thead>
<tr>
<th>CWPM:</th>
<th>Errors:</th>
<th>IOA:</th>
</tr>
</thead>
</table>

**Easier Material**

<table>
<thead>
<tr>
<th>Session No.</th>
<th>Date:</th>
<th>Phase:</th>
<th>Selected lower grade level passage. Grade:</th>
<th>Code:</th>
<th>Instructions</th>
</tr>
</thead>
</table>

Student read lower grade passage  

<table>
<thead>
<tr>
<th>CWPM:</th>
<th>Errors:</th>
<th>IOA:</th>
</tr>
</thead>
</table>

**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
Appendix C
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
Appendix C
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
Appendix C
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
Appendix C
Fidelity Checklist for INCENTIVE + REPEATED READING

**Incentive + Repeated Reading**

**Session No. _____**

*Date: ________________   Phase ________________*

Selected passage. Code ____________

Assessed general performance  CWPM ______  Errors ______

*IOA: ________

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

Reward coupon selected: ____________

___ Student read instructional passage 2 times

___ Instructions (make reference to goal)

Assessed instructional performance  CWPM:______  Errors ______

*IOA: ________

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

---

**Notes**
Appendix C
Fidelity Checklist for
INCENTIVE + LPP/PHRASE DRILL

Incentive + LPP/Phrase Drill

Session No. _____  Date: ___________________  Phase ___________________

Selected passage. Code __________
Assessed general performance  CWPM _______ Errors _______

IOA: _______
Goal set: Grade 1-2: 60 CWPM < 5 errors  or  ___ Grade 3+: 100 CWPM < 7 errors
Reward coupon selected: ____________
___Examiner read story once aloud while child follows along on copy.
___Student read phrase containing error three times each, with immediate correction
___Instructions (make reference to goal)
Assessed instructional performance  CWPM:_____ Errors _______

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

Notes

Fidelity Checklist for
INCENTIVE + LPP/PHRASE DRILL

Incentive + LPP/Phrase Drill

Session No. _____  Date: ___________________  Phase ___________________

Selected passage. Code __________
Assessed general performance  CWPM _______ Errors _______

IOA: _______
Goal set: Grade 1-2: 60 CWPM < 5 errors  or  ___ Grade 3+: 100 CWPM < 7 errors
Reward coupon selected: ____________
___Examiner read story once aloud while child follows along on copy.
___Student read phrase containing error three times each, with immediate correction
___Instructions (make reference to goal)
Assessed instructional performance  CWPM:_____ Errors _______

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

Notes
Appendix C
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 ______
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 _____
___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 ______
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 _____
___Incentive provided if earned, or consolation reward if score exceeds previous high score, or  no reward

Notes
## Appendix D
Teacher Interview Form

### TEACHER INTERVIEW FORM

Name of Child: ____________________________  Age: ______
Grade: ______ Grades retained (if applicable): ______
Does the child have an identified disability (please describe)? ______________
Does the child receive Title I services?: ______
Is the child on medication (please describe)? ______________
Does the child require glasses or large print? ______

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Motivation

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

Skill Fluency

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

Skill Acquisition

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

NEXT STEPS

Thank you for responding to these questions. In order to assess the severity of potential academic concerns, it is necessary to administer a 3-minute math exercise and a 3-minute writing exercise to the entire class. Would you be willing to administer these timed exercises?

A classroom observation will also be conducted to assess the child’s level of engagement. What is the best time to observe the child completing independent seatwork related to the area of academic concern?
## Appendix E

**Behavioral Observation System (B.O.S.)**

Name of student: ___________________________ Date: ____________ Observer: _______

Target Behavior(s) t1 = ___________________ t2 = ___________________

Setting: ____________________________

### Comments

<table>
<thead>
<tr>
<th>Child Mean</th>
<th>Peer Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total On=____% t1,t2=_____%</td>
<td>Teacher On\TA=<em><strong><strong>/____=</strong></strong></em> On\P=<em><strong><strong>/</strong></strong></em>=_____%</td>
</tr>
<tr>
<td>Peer Mean</td>
<td>On\TA=<em><strong><strong>/</strong></strong></em>=_____ On\P=<em><strong><strong>/</strong></strong></em>=_____%</td>
</tr>
<tr>
<td>Total On=____% t1,t2=_____%</td>
<td>t1,t2\TA=<em><strong><strong>/</strong></strong></em>=<em><strong><strong>% t1,t2\P=</strong></strong></em>/<em><strong><strong>=</strong></strong></em>%</td>
</tr>
</tbody>
</table>

### Table

<table>
<thead>
<tr>
<th>t1 on off</th>
<th>t2 on off</th>
<th>t3 on off</th>
<th>t4 on off</th>
<th>t5 on off</th>
<th>t6 on off</th>
<th>t7 on off</th>
<th>t8 on off</th>
<th>t9 on off</th>
</tr>
</thead>
<tbody>
<tr>
<td>t1 t2</td>
<td>t1 t2</td>
<td>t1 t2</td>
<td>t1 t2</td>
<td>t1 t2</td>
<td>t1 t2</td>
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<td>P C- C+</td>
<td>P C- C+</td>
<td>P C- C+</td>
<td>P C- C+</td>
</tr>
</tbody>
</table>

### Notes

- **Behavioral Observation System (B.O.S.):**
  - **Target Behavior(s):** t1 = ____________ t2 = ____________
  - **Setting:** ____________________________
  - **Comments:** ____________________________
  - **Data Collection:** ____________________________

- **Child Mean:**
  - Total On=____% t1,t2=_____% | Teacher On\TA=_____/____=_____ On\P=_____/_____=_____% |
  - Peer Mean | On\TA=_____/_____=_____ On\P=_____/_____=_____% |
  - Total On=____% t1,t2=_____% | t1,t2\TA=_____/_____=_____% t1,t2\P=_____/_____=_____% |

- **Peer Mean:**
  - On\TA=_____/_____=_____ On\P=_____/_____=_____% |
  - Total On=____% t1,t2=_____% | t1,t2\TA=_____/_____=_____% t1,t2\P=_____/_____=_____% |

---

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Appendix F
EXPERIMENTAL CONDITIONS

Baseline and all other conditions

1. Use the instructional passage.

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


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

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

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

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

4. Repeat twice more.

5. Turn tape recorder off.

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

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

Cautions:

1. Do NOT supply the word!

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

3. “Flip-flops” count as one error.
Appendix F

**Incentive**

1. Use instructional passage.

2. Determine proper goal from baseline.

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

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

3. Present child rewards from “Goodie Bag.”

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

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

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

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

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

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

**Repeated Reading**

1. Use instructional passage.

2. Tell the child:

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

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

4. With the instructional passage, give the child probe instructions (these may be shortened) and have him/her read for one minute.

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

**Listening Passage Preview/Phrase drill**

1. Use instructional level passage.

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

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

4. Tell the child:
   
   "*This time I want you to read the story aloud while I listen.*"

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

6. After the student has completed the passage, point to each error on their copy and read the word to them (maximum 15 words).
   
   "*Let's go over the words you had problems with… This word is _____. This is ____.*"

7. Have the student read short phrases that contain each error word three times, correcting errors immediately.
   
   "*Now, I want you to read each word that I point to. (Point to phrases). Again…*"

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

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

**Easier Material**

1. Use *lower level* instructional passage.

2. Give the student probe instructions for reading the passage (these may be shortened).

Stop him/her at approximately 40% past BL (______ CWPM).