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# A Comparison of Reading Interventions Based on Preference to Reading Interventions Identified by Brief Experimental Analysis

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The University of Southern Mississippi

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TO READING INTERVENTIONS IDENTIFIED BY  
BRIEF EXPERIMENTAL ANALYSIS

by

Deborah Eda Smyth

Abstract of a Dissertation  
Submitted to the Graduate Studies Office  
of The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy

December 2008

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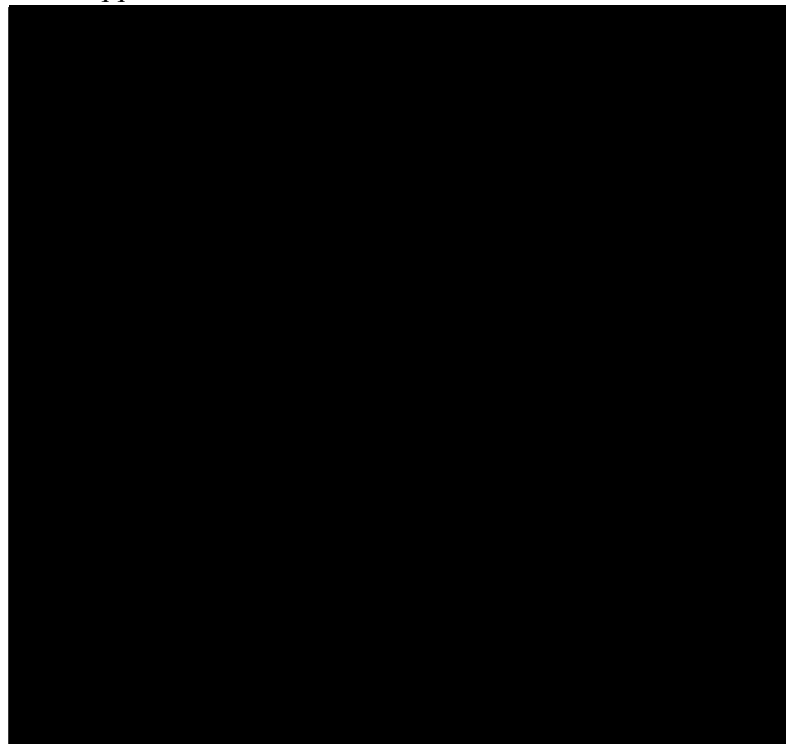
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## ABSTRACT

### A COMPARISON OF READING INTERVENTIONS BASED ON PREFERENCE TO READING TO INTERVENTIONS IDENTIFIED BY BRIEF EXPERIMENTAL ANALYSIS

by Debborah Eda Smyth

December 2008

The available literature on children's acceptability of interventions is rather sparse and offers little support for the link between acceptability and effectiveness (e.g., Foxx & Jones, 1978; Shapiro & Goldberg, 1986; Turco & Elliot, 1990). The present study compared the effects of treatment preference to treatment effectiveness using a brief experimental analysis to select skill-based oral reading fluency interventions. The use of a brief experimental analysis (BEA) (Daly, Martens, Hamler, Dool, & Eckert, 1999) has been demonstrated to be an effective procedure for selecting oral reading interventions. However, the studies on brief experimental analysis to date have not examined student acceptability of oral reading interventions. Three participants were selected based on deficits in oral reading fluency. A brief experimental analysis of four reading fluency interventions was conducted with each student. Students were then asked to rank the interventions based on preference. An alternating treatments design was used to compare the preferred intervention to the most effective intervention as identified by the BEA. The mean correct words per minute (CWPM) was greater for two of the students in the effective intervention. For one student the preferred intervention was the most effective. Limitations and future directions for research are discussed.

## DEDICATION

Dedicated to the life and work of two scholars and healers; The Reverend Dr.  
Charles David Christian and Debra Giddens.

## ACKNOWLEDGMENTS

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## CHAPTER I

### INTRODUCTION

Research has demonstrated that children who read well in the early grades experience greater success in later years, whereas children who fall behind in reading often remain behind (Good, Simmons, & Smith, 1998; Snow, Burns, & Griffin, 1998; Stanovich, 1986). Improving the reading skills of children has become a national concern as reflected in the mandates of No Child Left Behind (NCLB) 2001. Included in these mandates is the requirement for each state to prepare an annual report measuring the annual yearly progress in reading skills for children in grades 1 and 2. Additionally, states must ensure that annual performance assessments are conducted with all children in grades three through eight (NCLB, 2002).

Although the documentation from individual states suggests that progress is being made in improving reading skills, a comparison of state to national standards of annual progress reveals a considerable discrepancy. For example, under NCLB, 79.3% of Mississippi schools are meeting the Adequate Yearly Progress goal measured by the earlier version of the Mississippi Curriculum Test (MCT) (U.S. Department of Education, 2008). This achievement places the progress of Mississippi students above the national average of 70% (United States Department of Education, 2008). According to Mississippi's Department of Education Office of Research and Statistics (2006), for the 2005-2006 school year, 88% of fourth grade students performed at or above the MCT Proficient level in reading. Yet, in 2005, the National Assessment of Educational Progress (NAEP, 2005) reported that only 18% of fourth grade students in Mississippi performed at or above the NAEP Proficient level in reading. The disparity between state

and national standards suggests either state standards have been set below the national standards or Mississippi schools are having difficulty implementing the standards set by NAEP. Regardless of the reason for this disparity, the discrepancy between state and national standards makes it difficult for Mississippi's students to be academically competitive on a national level.

The reading skills of students nationwide are also cause for concern in that only 32% of the nation's fourth-graders demonstrated academic achievement at or above the Proficient level (NAEP, 2005). Although scores of the highest performing students have increased over time, the scores of America's lowest performing students have declined (NAEP, 2001), providing evidence of the "Matthew Effect" (Stanovich, 1986). The "Matthew Effect" references the biblical passage where the rich get richer and the poor get poorer, or in this case, proficient readers continue to evidence proficiency while poor readers fall further and further behind.

According to Stanovich (1986), documented differences in the amount of vocabulary knowledge of young children are evident as early as the middle of the first grade. These differences in initial skills such as phonological awareness lead to more rapid acquisition of vocabulary growth for good readers, which in turn leads to more efficient reading. Thus, according to Stanovich (1986):

Children who are good readers and who have good vocabularies will read more, learn more word meanings, and thus read even better. Children with insufficient vocabularies, read less, and hence are slower to develop vocabulary knowledge, which slows further development in reading. (p. 381)

In the case of struggling readers, the need for effective intervention is often confounded by motivational variables such as task engagement on the part of the reader (Snow, Burns, & Griffin, 1998; Stanovich, 1986; Torgesen, 2002). A study conducted by Butkowsky and Willows (1980) found that poorer readers demonstrated less perseverance on reading tasks. More recent research (Gambrell, Wilson, & Gantt, 2001) compared on-task behavior of good and poor readers during instructional reading time and noted similar results. Good readers spent more time engaged in reading contextually related words (57%) than poor readers (33%) and less time (36%) engaged in non-reading behaviors such as listening, writing, or speaking. The preference or choice of specific reading interventions may be a critical dimension for delivering effective reading interventions, thus meriting consideration for further research.

For struggling readers, early effective interventions are especially critical. To become proficient readers, children must acquire the ability to read fluently (Snow et al., 1998; Torgesen, 2002). Fluency is the ability to read “quickly, accurately, and with proper expression” (National Institutes of Child and Human Development [NICHD], 2002, p. 3-5). Empirically supported reading interventions targeting acquisition and fluency include repeated readings (Rashotte & Torgesen, 1985), listening passage preview (Daly & Martens, 1994) and error correction (O’Shea, Munson, & O’Shea, 1984). Repeated reading provides multiple practice opportunities by having the student read a passage several times. Listening passage preview incorporates modeling into the instructional process by having the student listen to a passage before reading the passage alone. Error correction is a strategy that also incorporates modeling by providing

immediate corrective feedback and repeated practice. These interventions may be administered individually or combined based on the needs of the student.

As Good et al. (1998) pointed out, linking assessment to intervention is critical to the goal of adequate reading skills for all students. Fortunately, the field of education has empirically supported principles and practices from which to select effective reading interventions. One such practice is the use of a brief experimental analysis (BEA), which can be used to link assessment of student performance to intervention. The use of a BEA may be an effective tool to use when selecting an evidence-based intervention (Martens, Eckert, Bradley, & Ardoin, 1999).

#### Brief Experimental Analysis

In their meta-analysis of the research on BEA, Burns and Wagner (2008) noted that BEA developed out of applied behavior analysis, a scientific process in which principals of behavior are applied within the context of experimental analysis to improve socially significant behavior (Cooper, Heron, & Heward, 2007). The objective of experimental analysis is to compare changes observed in an individual's behavior to one or more variables as a way of understanding why a behavior occurs as well as the most effective strategy for intervention (Baer, Wolf, & Risley, 1968). In order to achieve this objective, researchers have used single-case designs that compare behavior under treatment and no-treatment conditions. In the 1980's researchers began to employ the use of experimental analysis to discover variables maintaining problem behaviors and to develop hypotheses regarding the function the problem behavior served for the individual. The results of these analyses were then utilized to develop interventions for decreasing or eliminating problem behaviors while increasing appropriate behaviors

(Martens et al., 1999). Although most of these early studies were conducted in inpatient settings, researchers in the 1990's modified elements of single case designs by comparing a number of school-based interventions over a brief period of time. These BEA's allowed for several treatments to be evaluated prior to implementation (Eckert et al., 2000). The term BEA is used to describe the systematic evaluation of two or more antecedent procedures designed to improve problem behavior or academic deficits. Thus, BEA attempts to answer the question of which intervention is the more effective (Martens et al.).

BEA has been defined as a method utilized with curriculum-based data to increase the probability of determining a functionally appropriate intervention (Chafouleas, Riley-Tillman, & Eckert, 2003). The procedure, which involves administering short assessment conditions or a combination of conditions, has been used to select empirically validated oral reading fluency interventions (e.g. Daly, Martens, Hamler, Dool, & Eckert, 1999). The conditions that result in the largest gains over baseline can then be further evaluated through the use of an extended analysis (Daly, Murdoch, Lillenstein, Webber, & Lentz, 2002). The use of a BEA allows educators to assess the effectiveness of the interventions on a case-by-case basis before making recommendations to improve a struggling student's performance (Daly et al., 2002).

Regardless of whether a BEA is applied to behavioral or academic interventions, Martens et al. (1999) described several of the features that are common to this analysis. First, most interventions require new learning on the part of the student. In order to evaluate the strength of the interventions using brief test conditions, the learning must occur quickly and result in immediate and measurable changes in behavior. Second, the

measures should be a direct assessment of the behavior of concern, occur during or immediately following the test condition, and involve some type of rate or frequency measure. Third, a strategy must be implemented which allows for comparison of multiple treatment alternatives to each other and to a no treatment baseline. Furthermore, BEA must allow one to conclude that treatment was responsible for the changes in the behavior that occurred.

BEA has been applied in school settings as a strategy for comparing two or more interventions (e.g., Daly et al., 1999; Duhon et al., 2004; Eckert, Ardoin, Daly & Martens, 2002; VanAuken, Chafouleas, Bradley, & Martens, 2002). When comparing academic interventions, a BEA typically involves manipulating two or more treatments as short test conditions while evaluating changes in the child's academic or behavioral performance.

#### *Research on BEA*

*Studies using BEA alone.* Harding et al. (1994) used BEA to assess the effectiveness of treatment components to reduce off task and inappropriate behavior. The participants were seven children who were patients in an outpatient treatment setting. Treatment components were administered in a hierarchy beginning with antecedent interventions (e.g., specific directions, specific directions + choice making) and ending with consequent components (e.g., differential reinforcement of appropriate behavior (DRA), differential reinforcement of communication (DRC), preferred activity, punishment, and time out). The treatment components were also assessed individually and in combination in order to identify the intervention package that was the easiest for the parents to implement.



Experimental control using a mini-withdrawal design was demonstrated for 6 out of 7 participants. During the mini-withdrawal, the first successful condition was followed by a formerly unsuccessful condition. After presenting the formerly unsuccessful condition, the successful condition was then repeated. All seven children demonstrated improved behavior. The targeted behavior of three of the children improved with a change in the antecedent components (specific directions and choice making) while the targeted behavior of three of the remaining participants improved with a change in the consequent components. In addition to demonstrating the treatment utility of BEA, this study identified a method to empirically identify effective intervention packages.

Moving away from social behavior to academic behavior, McComas et al. (1996) conducted a BEA of reading comprehension and spelling interventions with four students with learning disabilities. After a baseline condition, during which no strategy was introduced, one intervention condition was introduced at a time. Each intervention was implemented until gains in performance were observed. At that point, ineffective and effective interventions were alternated within a multi-element design. The results demonstrated increases in academic performance corresponding with at least one of the interventions per child. Although the study was limited by the possibility of multiple treatment interference and the lack of an extended analysis, immediate increases in academic performance were observed for three of the four participants. These results suggest that BEA may be a useful strategy to employ when attempting to identify effective academic interventions.

Similar to McComas et al. (1996), Eckert et al. (2002) applied a BEA in a school setting to evaluate whether the use of an antecedent intervention (listening passage

preview and repeated readings) could improve oral reading fluency when combined with either contingent reinforcement or performance feedback. The participants were six elementary school students identified by their teachers as having reading difficulties. Following a baseline, multiple conditions including (a) antecedent intervention, (b) antecedent intervention and contingent reinforcement, (c) antecedent intervention and performance feedback, and (d) antecedent intervention, performance feedback, and contingent reinforcement were alternated in a multi-element design.

The conditions were presented in randomized order for four participants with each condition occurring with the same degree of frequency (Eckert et al., 2002). For the remaining two participants, the conditions were presented in sequential order. The results indicated that oral reading fluency increased under the antecedent reading condition for all participants. Furthermore, for four of the six participants, the effectiveness of the antecedent reading condition was improved by the addition of one or both consequences. The Eckert et al. study suggests that a BEA may be useful in assessing the relative contributions of antecedent and consequent strategies for identifying effective components of a reading intervention.

Although studies on BEA often present conditions in a randomized order, Daly et al. (1999) ordered the reading interventions hierarchically according to how much adult participation was required to administer the interventions as well as the results of the preceding condition. A BEA was used to evaluate interventions for four children experiencing problems in reading. Following a baseline, during which no instruction was provided, the interventions (Reward; Repeated Readings; Repeated Readings/Sequential Modification; Listening Passage Preview/Repeated Readings; Listening Passage

Preview/Sequential Modification; Listening Passage Preview/Repeated Readings/Easier Materials) were presented in the order of the intrusiveness of the intervention, with the least complex intervention (Reward) presented first. The sequence was used in order to identify the intervention package that required the least amount of adult involvement to produce treatment gains that were visibly discernable from baseline and previous treatment conditions.

When visible differences relative to prior conditions and baseline were observed, the sequential application of intervention conditions was discontinued. All four participants demonstrated improvements in reading fluency. Two of the participant's demonstrated the most improvements in reading fluency when two interventions were applied (RR/SM), and two participants demonstrated the greatest improvement when three interventions (LPP/RR/SM and LPP/RR/EM) were combined. Further, the results of this study indicate that a BEA may be used to probe reading interventions in an idiographic manner in order to make empirically sound treatment recommendations.

*Studies using BEA with extended analysis.* Although studies have shown that BEA alone can be an effective strategy when selecting interventions, the treatment utility of the selected intervention can only be confirmed through the use of extended analysis. The treatment utility of an extended analysis was demonstrated in a study by Noell, Freeland, Witt, and Gansle (2001). The researchers assessed how accurately a brief assessment predicted a student's response to intervention when the intervention was implemented over days or weeks. The study included a brief assessment with a withdrawal design and an extended analysis using a multiple baseline across letter sounds, sight words, and first, second, or third grade prose depending upon level of difficulty (Noell et al.). Results

indicated that brief assessment and extended analysis resulted in the same decision regarding the intervention's effectiveness for 83% of the cases.

In addition to demonstrating the treatment utility of BEA, the Noell et al. (2001) study provided the following support for integrating BEA into practice as an assessment tool. First, assessments were relatively brief. Second, the majority of analysis produced obvious results supporting specific intervention strategies. Third, the most effective interventions identified by the BEA had a high probability of being effective in the extended analysis.

VanAuken et al. (2002) also examined the treatment utility of a BEA. The authors extended the previous study (Noell et al., 2001) on the treatment utility of BEA for selecting reading interventions targeting acquisition and fluency. In this study, oral reading interventions were selected based on ease of implementation. Combinations of interventions were also used (e.g. listening passage preview plus repeated reading). During the extended phase, the most effective packages were alternated with the least effective packages. Results showed the intervention identified as most effective produced greater initial gains in reading for two children and greater gains in reading throughout the extended analysis for the third child. The authors pointed out a limitation in that combining interventions, one is not able to isolate which component or combinations of components were responsible for increases in reading fluency. Nevertheless, the study provides further evidence of the treatment utility of BEA in selecting effective oral reading fluency interventions.

Although the investigators chose mathematics, not reading, as their area of focus, a study by Carson and Eckert (2003) examined the effects of student-selected versus

empirically-selected interventions. Like the previous BEA studies, the authors hypothesized that a BEA would effectively identify interventions to improve mathematical fluency. In addition, it was hypothesized the students would demonstrate increased fluency following student-selected interventions as opposed to empirically-selected interventions. The participants consisted of three fourth grade students identified as having performance deficits in basic math computation. In the first phase of the study, baseline and experimental conditions (contingent reinforcement, goal setting, feedback on digits correct, and timed-sprint intervention) were presented in a randomized order with each condition occurring with the same degree of frequency.

The empirically selected intervention was the intervention that produced the highest mean digits correct per minute (DCPM). The student-selected intervention was determined after the participant and experimenter reviewed the procedures associated with each intervention and the student selected the intervention procedure he or she thought was the most effective for solving mathematics problems. All of the students chose contingent reinforcement. During the second phase, an alternating treatments design was used to compare the effects of the empirically-selected intervention to the student-selected intervention.

Although all three participants demonstrated increases in DCPM, the empirically-selected intervention i.e., timed-sprints produced the greatest treatment gains. However, as the authors pointed out, even though the students were asked to select the intervention they thought would be the most effective in improving their performance, it is possible the students selected the intervention only to gain a preferred item (Carson & Eckert, 2003). In spite of this limitation, the Carson and Eckert study extended the literature on

choice making using a BEA with students in the general education setting. The Carson and Eckert study is also notable in that it evaluated the relationship between acceptability and effectiveness with a BEA using student choice to measure acceptability.

#### Treatment Acceptability

According to Schwartz and Baer (1991), having a client choose a particular treatment is a key measure of a program's social validity. In his seminal article, Wolf (1978) conceptualized the issue of social validity on three levels: (a) the social significance of the goals, (b) the social acceptability of the treatment and (c) consumer satisfaction with the results. Therefore, acceptability has been thought of as a subset of social validity and may be defined as the extent to which an intervention is perceived as suitable, appropriate, and just (Kazdin, 1981).

In one of the first school-based models of treatment acceptability, Witt and Elliott (1985) proposed a model that incorporates elements of treatment acceptability, treatment use, treatment integrity, and treatment effectiveness. The authors described the relationship among these elements as "sequential but reciprocal" (p. 274), with the element of acceptability as the initial concern in the progression of treatment selection and use. If the treatment is judged as acceptable, the probability of using the treatment is greater in relation to other comparable treatments. Treatment integrity is linked to treatment use and treatment effectiveness by increasing the probability of the intervention's effectiveness. Lastly, if the treatment is judged as effective by the consumer, there is a greater probability that the treatment will be evaluated as acceptable (Witt & Elliott). Although this and other models of treatment acceptability (e.g., Reimers, Wacker, & Koepl, 1987) suggest treatment use is related to treatment acceptability,

these relationships have received little attention, particularly as they apply to academic interventions selected by children in a school setting.

Thirty years ago, the majority of the research on treatment acceptability was restricted to quasi-experimental, large  $N$  designs that were analogue in nature (Elliott, 1988). In these studies, participants were presented with a hypothetical problem-treatment scenario and asked to complete an evaluation rating the treatment. Kazdin's (1981) study illustrates this type of research. In this analogue experiment, undergraduate students were asked to complete questionnaires designed to measure treatment acceptability. Prior to completing the questionnaires, students heard two tapes. The first tape provided a clinical description of a child whose behaviors justified treatment. The second tape described four different treatments specific to the problem behavior (i.e. reinforcement, positive practice, time out, and medication). In order to evaluate the degree to which treatment effectiveness influenced acceptability ratings, statements about two levels of treatment effects, strong or weak, were included in each treatment description. The participants rated reinforcement as the most acceptable treatment followed in order of acceptability by positive practice, time out, and medication. The reported effectiveness of the treatments did not influence the acceptability ratings.

Further review of the acceptability literature finds most of these studies have been conducted in analog setting using survey methods with undergraduate students (e.g., Tingstrom, McPhail, & Bolton, 1989), teachers (e.g., Von Brock & Elliott, 1987), or parents (e.g., Frentz & Kelley, 1986). As Eckert and Hintze (2000) noted, the generalizability of these studies is limited by the survey and analogue methods used since subjects may respond differently than they would in a naturalistic setting. Furthermore,

the use of surveys limits the ecological validity of the results since generalization to individuals beyond those in the sample population is questionable (Witt, Martens, & Elliott, 1984).

Limitations have also been reported in regards to the measures used to assess acceptability. In the studies cited in the preceding paragraph treatment acceptability was measured through the use of various rating scales including the Treatment Evaluation Inventory (TEI; Kazdin, 1980) and the Behavior Intervention Rating Scale (BIRS; Von Brock & Elliott, 1987). According to Witt and Elliott (1985), the reliability of the TEI has not been established.

To date, the Children's Intervention Rating Profile (CIRP; Witt & Elliott, 1985) is the only scale developed to assess treatment acceptability with children. The CIRP consists of seven items relating to the effectiveness and fairness of behavioral treatments. The scale has a fifth grade readability level and has been normed on over 1000 students in the fifth through tenth grades. Neither the reliability nor the predictive and concurrent validity of the CIRP has been established (Elliott, 1986).

Unfortunately, few studies have been conducted on the acceptability-effectiveness link of interventions from the child's point of view. Four of the studies that have done so evaluated the acceptability of treatments to improve spelling performance. In the first study by Foxx and Jones (1978), four experimental conditions were counterbalanced in fourth, fifth, seventh, and eighth grade classes. The conditions consisted of: (a) pretest/test, (b) test/ positive practice, (c) pretest plus positive practice of the pretest plus a weekly test, and (d) a pretest, positive practice of the pretest, weekly test, plus positive practice of the weekly test. Following a 16-week baseline, each condition was in effect



for four weeks. At the end of each of the four conditions the students were given a questionnaire which asked them to assess how effective the procedure had been in improving their spelling performance, how the procedure had impacted their feelings about spelling, and if they would use the procedure if they were a spelling teacher.

Although the results demonstrated the pretest, positive practice of the pretest, weekly test, plus positive practice of the weekly test condition was the most effective for increasing the spelling averages in all four classes, the responses on the questionnaire were similar for all four procedures. That is, the students indicated that all of the procedures were helpful, their feelings about spelling increased or remained the same, and they would use the procedure if they were the teacher. This apparent lack of relationship between the questionnaire data and the observed behavior of the students lead the authors to conclude that the questionnaire data were not very dependable, and observational data should be employed as dependent measures when developing interventions. An alternative interpretation of the results may be that the students found all the interventions equally acceptable. Had one of the interventions been rated as unacceptable, intervention effectiveness may have been impacted.

Subsequent research has provided partial support for the acceptability-effectiveness relationship. Ollendick, Matson, Esvelt-Dawson, and Shapiro (1980) conducted two studies using an alternating-treatments design to evaluate the effectiveness of spelling interventions modeled after the Foxx and Jones (1978) study. The first study compared the effects of positive practice procedures with reinforcement (PPR+) to positive practice procedures without reinforcement (PP). Both conditions were compared to a no-remediation control condition. In the second study, PPR+ was compared to a

conventional correction procedure with and without reinforcement. In both studies, PPR alone was implemented alone during the final phase.

As in the Foxx and Jones (1978) study, a questionnaire was administered to the participants of both studies asking them to indicate which procedure was the most preferable, which procedure they would choose, and from which procedure did they learn the most. Four participants across two studies were included, three of whom were functioning two to three grades below their age level in spelling. For these three participants, positive practice plus positive reinforcement was both the most preferred as well as the more effective intervention. However the relationship between the acceptability and effectiveness in this study is weakened by the fact that the spelling accuracy of one of these participants was only slightly improved in the PPR condition (Ollendick et al., 1980).

Shapiro and Goldberg (1986) used an alternating treatments design to examine the acceptability of independent, interdependent, and group contingencies to increase spelling performance. Independent group contingencies necessitate the same response for all the students, but reinforcement is contingent on individual response. Interdependent group contingencies make reinforcement contingent on the combined performance of the group. Dependent group contingencies make reinforcement contingent on the performance of a specific member or members of a group.

Participants consisted of 53 sixth grade students. Following baseline, the three treatment conditions were counterbalanced across days using an alternating treatment design. Students completed a modified version of the CIRP (Witt & Elliott, 1985) before beginning the final phase of the study that consisted of the most effective treatment

condition. Although all three types of contingencies appeared to be equally effective in improving spelling performance, the students rated acceptability of the independent contingency significantly higher than either of the two remaining contingencies. The lack of relationship between the acceptability ratings and the effectiveness of the interventions may have been influenced by the participants' failure to consider the goals of the intervention when rating the intervention. As Elliott, Witt, Galvin and Moe (1986) pointed out, problem-solution thinking is not well developed at this age. However, the authors of the study noted that, although the interventions may have been equally effective, the students actually experienced the three contingencies before completing the CIRP.

Elliott (1988) noted that "establishing causal relationships between acceptability and effectiveness and effectiveness and acceptability require pre and post treatment acceptability measures to be correlated with post treatment effectiveness" (p.132). Turco and Elliott (1990) examined the relationship between pre and post treatment acceptability and treatment effectiveness of task structures (individual or group) and incentive structures (interdependent, dependent, or no-incentive) designed to improve the spelling achievement of fifth grade students. Students were rank ordered according to their subtest score on a standardized measure of achievement and assigned to one of six treatment teams. The students were then assigned to study teams and instructed to study together or alone. Treatment acceptability as measured by the CIRP was assessed before and after the interventions

The study found that interdependent group contingencies lead to significant gains in spelling performance on the Wide Range Achievement Test –Revised. Although the

researchers predicted there would be a significant relationship between the student acceptability ratings and the effectiveness of the interventions, correlational analysis failed to support such a relationship. Furthermore, substantial decreases were found in the acceptability ratings over time.

One study that did show a positive relationship between acceptability and effectiveness was conducted in a school setting (Allinder & Oats, 1997). Twenty-two elementary special education teachers monitored two students each using curriculum-based measurement (CBM; Deno, 1985) in the area of math over a four-month period. Student achievement was determined based on student growth on the CBM math probes as measured by the slope of performance. Teachers completed the CBM Acceptability Scale (CBM-AS) and were divided into two groups (high-and low-acceptability) based on their scores. The results indicated that teachers in the high acceptability group administered more CBM probes and set higher goals for their students. Furthermore, the students of these teachers demonstrated greater growth on the CBM math probes than their counterparts.

Although these results suggest a relationship between teacher acceptability and student performance, the strength of this relationship may have been influenced by the fact that the teachers completed the acceptability ratings after they had implemented CBM in their classrooms. Thus far, the research by Allinder and Oats (1997) provides the strongest support for the relationship between intervention acceptability and efficacy. However, a review of the research does not offer strong support for a relationship between treatment acceptability and treatment effectiveness. Sterling-Turner and Watson (2002) came to a similar conclusion investigating the relationship between treatment

acceptability and treatment integrity. As the authors of that study suggested, this lack of support may speak more to how acceptability is measured than to the construct of acceptability itself.

Hanley, Piazza, Fisher, Contrucci and Maglieri (1997) used a functional analysis to demonstrate that preference and social acceptability of behavioral interventions can be assessed directly by presenting different treatments in a choice arrangement to the actual person receiving treatment. More importantly, the literature supports a relationship between acceptability as measured by preference and choice and increased academic performance and task engagement (Cosden, Gannon, & Haring, 1995; Dyer, Dunlap, & Winterling, 1990; Moes, 1998; Williams & Collins, 1994).

Although the aforementioned study by Carson and Eckert (2003) failed to support the effect of choice making, an earlier study (Williams & Collins, 1994) that also investigated math facts fluency, found that student-selected material prompts (poker chips, number line, student fingers) resulted in a higher percentage of correct responding when compared to the same prompts selected by the teacher. Baseline probes assessing multiplication facts were administered to four students diagnosed as having learning disabilities. During the teacher-selected prompting sessions, multiplication facts were presented to the student. If the participants responded incorrectly or failed to respond within the prescribed interval, the teacher instructed the participant to use a specified prompt. During the student-selected condition the student was instructed to choose one of the three material prompts. Data were collected for the percentage of correct independent responses.

The results demonstrated that although both prompting procedures were effective, the student-selected condition resulted in greater gains across participants. Maintenance data were collected once the participant reached the criterion of a set of facts (i.e., 3 consecutive days at 90%). During the maintenance trials 3 of the 4 participants performed at criterion.

Moes (1998) evaluated the effect of providing the opportunities to make choices on the performance of four students with autism. In this study, choice making was applied in the context of the actual homework assignments given to the participants by their classroom teachers. Experimental conditions consisted of a no-choice and choice condition. In the choice condition, the student was allowed to choose the order of activities, the order of the problems within the homework activities, and materials necessary for homework completion. In the no-choice condition the tutors assigned to the individual participant made these decisions. Four dependent variables (percent of correct responses, rate of homework completion, percentage of intervals with disruptive behaviors, and affect) were assessed. Percentage of correct responses was determined by dividing the number of correct responses by the total number of homework demands given. Rate of homework completion was calculated dividing number of completed number of homework trials by the amount of time spent in the homework session. Disruptive behaviors were defined as any behaviors incompatible with homework completion (e.g. out of seat, bolting, aggression, throwing objects).

The results showed that overall student performance in the choice condition resulted in higher levels of correct responding, greater rates of homework completion,

and lower rates of disruptive behaviors, and improved affect. These results support the benefit of student choice on accuracy and productivity.

Task engagement has been cited as motivational variable related to good readers (Gambrell, Wilson, & Gantt, 2001). The relationship between choice and task engagement was examined by Killu, Clare, and Im (1999). The study examined the effects of choice and no choice of preferred and non preferred activities on on-task behavior. Participants consisted of three students with disabilities. A preference assessment was conducted to determine the participants preferred spelling tasks. The five most frequently selected tasks were determined to be the preferred tasks. The five least frequently selected tasks were determined to be the nonpreferred tasks. Six conditions were presented as follows: (a) choice of preferred tasks, (b) choice of non preferred tasks, (c) no choice of preferred tasks, (d) no choice of non- preferred tasks (e) no choice of preferred tasks, and (f) no choice of non- preferred tasks.

The study took place in the students' classroom when the students would typically be working on the spelling assignment. Data were collected separately for each participant's on-task engagement defined as working on task according to instruction, looking at the teacher during oral instruction, using materials related to the assignment, and asking questions related to the task.

For all three participants task engagement was the highest during the conditions involving preferred tasks regardless of whether the tasks were presented in a choice or no choice format. Furthermore, all three participants demonstrated the lowest occurrence of task engagement in the no choice of non-preferred activities condition. These findings are limited by the lack of a baseline condition, the lack of replication within subjects and the

possibility of sequence effects. Additionally, the difference in the percentage of intervals with on-task behavior between the choice preferred and the no choice preferred was 2% for two participants and 10% for the third participant. All of the conditions containing preference and choice resulted in task engagement above the 80% level suggesting that both of these variables contribute to increases in task engagement.

Dunlap et al. (1994) assessed the effects of choice making on task engagement and disruptive behavior for two students enrolled in a self-contained classroom. Data were collected using a 15-s continuous-interval system. In the no-choice condition, the teacher selected academic assignments. Data collection began after the students started independent seatwork. In the choice condition the student was given a menu drawn directly from the assignments presented in the no-choice condition. Students were asked to select an assignment from the menu and informed that they could change tasks during the session. Results showed that task engagement for both students was greater during the choice phase than during the no choice phase. Implications of these findings may be significant when developing teaching strategies to improve reading performance as poor readers demonstrate less perseverance on reading tasks (Butkowsky & Willows, 1980).

The majority of choice studies examining the effect of choice making on task performance have been conducted with persons with severe disabilities or problem behaviors. This study will extend the literature on choice making to a population of children without disabilities.

#### Statement of Purpose

The reading skills of students nationwide are cause for concern as poor readers fall further and further behind their higher achieving peers. The remediation of reading



difficulties can be accomplished through the application of interventions targeting oral reading fluency. One procedure for selecting reading interventions is the use of a BEA. BEA has been demonstrated to be an effective procedure in selecting robust oral reading interventions for an individual student (Daly et al., 1999). Although a BEA aides in selecting effective reading interventions, students may achieve better results when given an intervention that is more preferred. The available literature on children's acceptability using questionnaires and rating scales offers little support for the link between acceptability and effectiveness (e.g., Foxx & Jones, 1978; Shapiro & Goldberg, 1986; Turco & Elliott, 1990). However, the literature does support a relationship between acceptability as measured by preference and choice and increased academic performance and task engagement (Cosden, Gannon, & Haring, 1995; Dyer, Dunlap, & Winterling, 1990; Moes, 1998; William & Collins, 1994). Carson and Eckert (2003) examined the effects of student-selected versus empirically-selected interventions for math; however, no studies to date have examined student acceptability of oral reading interventions.

This study will examine the acceptability of reading interventions within the context of a BEA. An extended analysis will then be conducted to compare the intervention rated by the students during the BEA as most acceptable to the intervention that resulted in the largest gain. While the current study does not directly examine the relationship between acceptability and effectiveness, it does attempt to compare the effectiveness of an empirically selected intervention to the intervention ranked as most acceptable by the student.

### Research Question

1. What is the effect of student preferred reading fluency interventions relative to interventions that were demonstrated to be effective through the use of BEA?

## CHAPTER II

### METHOD

#### Participants and Setting

The current study was conducted in a rural school district in the Southeastern United States. Participants were 3 students who were randomly selected based on two criteria: enrolled in a second grade general education classroom and considered to be at some academic risk (i.e., reading between 52 and 68 words per minute) on the mid-year administration of the Oral Reading Fluency (DORF) subtest of the Dynamic Indicators of Basic Literacy Skills (DIBELS). Students were excluded based on the following criteria: (a) the student had been referred for or was found eligible to receive special education services according to teacher report, (b) the student was receiving supplemental classroom or individual reading interventions, and (c) the student's preferred intervention was the same as the empirically selected intervention. One student was excluded on the basis of the last criterion. For that student, a copy of the protocol for the intervention was given to the teacher and sent home to the parent as an aide to increase reading fluency.

"Fred" and "Rick" were 8-year-old males. Rick's teacher indicated Rick was prescribed medication for a diagnosis of Attention-Deficit/Hyperactivity Disorder. "Beth" was an 8-year-old female. All students were enrolled in separate second grade classrooms and had not received supplemental interventions in reading.

Parents, whose children were selected for the study, were informed of the procedures and signed an informed consent allowing their child to participate in the study (Appendix A). Teachers of the participants were also informed about the procedures for

the study and signed an informed consent to participate in the study (Appendix B). The study received Human Subjects Protection Review Committee Board approval at the governing institution of the primary investigator (Appendix C).

Experimental sessions were conducted outside of the classroom in a small room as free of distractions as possible. These sessions were conducted approximately three times a week and averaged 20 minutes in length. Sessions were scheduled so that participants were not removed during instruction in the core subjects of reading, language, and math.

### Materials

#### *Dynamic Indicators of Basic Literacy Skills - (DIBELS)*

The DIBELS are a set of individually administered, standardized measures of basic early literacy skills designed to screen and monitor progress of early literacy skills (Good, Simmons, & Smith, 1998). The DIBELS Oral Reading Fluency (DORF) passages were developed to be consistent with a curriculum based measure of ORF published as the Test of Reading Fluency (TORF) (Children's Educational Services, 1987). The median concurrent validity of DORF passages with TORF passages was .92 and ranged from .92 to .96. The median alternate-form reliability coefficient for the DORF passages was .95 (Good, Kaminski, Smith, & Bratten, 2001).

Decision rules used to establish cutoff scores for level of risk are based on the predictive validity of achieving subsequent benchmark goals (Good, Simmons, Kame'enui, Kaminski, & Wallin, 2002). Second grade students whose middle of the year DIBELS oral reading fluency scores (DORF) fall between 52 and 68 correct words per

minute have a 38% chance of achieving the end of the year benchmark goal of 90 CWPM (Good et al., 2002).

The participant's school subscribed to DIBELS Data System (DIBELS, 2001). The DIBELS Data System is a database that allows schools to enter the results of DIBELS benchmark assessment scores and progress monitoring scores online. This system has the capacity to generate a grade list report containing the scores, percentiles, and instructional recommendations resulting from the benchmark measures that are administered three times a year. A list of participants was generated from the second grade list report containing the mid-year DIBELS oral reading fluency scores for all students in the grade. Second grade DIBELS progress monitoring passages were used as follow up probes following the extended analysis..

#### *Instructional passages*

Second grade passages of narrative text were randomly chosen from the Silver, Burdett, and Ginn basal reading series (Pearson et al., 1989) and used in the BEA. All passages were typed on individual sheets of paper and ranged from 90 to 115 words in length. Second grade passages of narrative text from the AIMSweb® reading series (Edformation, 2001) were used in the alternating treatments phase. To reduce the risk of carry-over effects across sessions, participants were only exposed to each passage for one session.

#### *High content overlap passages*

HCO second grade passages were selected from the Silver, Burdett, and Ginn reading series (Pearson et al., 1989) and used in the BEA as generalization probes. HCO passages are passages that contain large percentages of the same words in an equivalent

passage (Daly et al., 1999). Percentage of overlap was calculated by counting the number of words in the assessment passage that appeared in the generalization passage. The average percentage of passage overlap was 86%.

## Procedure

### *Screening*

A sample of all students meeting the inclusion criteria was developed using the grade list report generated by the DIBELS Data System (DIBELS, 2001) for mid-year ORF screening. A total of 52 second grade students were identified as “Some Risk.” Nine of these students did not meet the criteria for inclusion. The remaining students were ranked using a computer generated random number program. The three participants selected for inclusion consisted of the first three students meeting inclusion criteria whose numbers matched the order chosen by computer program. Following the random selection of participants, the primary investigator obtained written informed consent from the participant’s parent and teacher.

### *Brief Experimental Analysis*

The primary investigator was responsible for conducting the BEA. A baseline condition was implemented at the beginning of the BEA. During the baseline condition, the participant was required to read three grade level passages. Correct words per minute (CWPM) and number of errors were assessed for each passage. The median CWPM of the three passages and the median number of errors from the three passages were recorded. Following baseline, instructional conditions were arranged to insure that the interventions were presented in a different order for each participant. Immediately after each instructional session, a generalization probe was administered. Again, CWPM and

the number of errors per condition were assessed. Where an intervention demonstrated a difference relative to baseline and the other instructional conditions, a mini-withdrawal consisting of a baseline condition was conducted followed by the last effective intervention.

### *Acceptability Rankings*

After the implementation of the BEA, participants were asked to rank the interventions by preference. The reading probes for the four reading interventions were color-coded and randomly assigned for each participant. For example, the Repeated Reading probe for student “A” may be red while the Repeated Reading probe for student “B” may be blue and so on. Participants were given a brief written explanation of each intervention as a prompt to remind them of the intervention. The most preferred intervention was selected for implementation in the comparison condition. One participant selected the most effective intervention as their most preferred intervention and was therefore excluded from the study. A copy of the intervention protocol was given to this participant’s teacher and parent as an aide to increase reading fluency. The participant was replaced by the next eligible student.

### *Alternating Treatments Phase*

The results of the BEA and the acceptability rankings were used to compare the effects of the student-selected to the empirically-selected interventions. The order of conditions was determined randomly with the restriction that no one condition could be conducted more than three times sequentially. Two participants received 21 total sessions of intervention and one participant received 20 sessions of intervention in keeping with

the State Education Agency requiring interventions to be implemented from six to nine weeks.

### *Experimental Conditions*

Treatment components for the BEA and the alternating treatments phase included the following conditions: repeated readings (RR; Rashotte & Torgesen, 1985), repeated readings with error correction (RR+EC), listening passage preview (LPP; Daly & Martens, 1994) with repeated reading (LPP+RR), and listening passage preview with repeated reading and error correction (LPP+RR+EC). See Appendix D, E, F, and G for complete scripts. Baseline was obtained at the beginning of the brief experimental analysis and prior to the implementation of the alternating treatment phase.

*Baseline.* No instructional components were provided during baseline. In this condition, the student was administered three reading probes and the median score of the three probes was obtained in accordance with curriculum-based measurement procedures of oral reading fluency (Shinn, 1989). See Appendix H for protocol.

*Repeated readings (RR).* In the RR condition, the student read a passage four times. During each passage reading, if the student hesitated on a word for more than 3 seconds or read the word incorrectly, the examiner said the word and had the student repeat the word three times. After each reading the student was told how long it took to read the passage. Assessment results were based on the student's reading performance during the first minute of the fourth reading of the instructional passage.

*Listening passage preview/repeated readings (LPP+RR).* In the LPP+RR condition the passage was read to the student while the student followed along with his or her finger. The experimenter observed the student to make certain that the student was



following along. Next, the student read the passage four times. During each passage reading, if the student hesitated on a word for more than 3 seconds or read the word incorrectly, the examiner said the word and had the student repeat the word three times. After each reading the student was told how long it took to read the passage. Assessment results were based on the student's reading performance during the first minute of the fourth reading of the instructional passage.

*Repeated readings/error correction (RR+EC).* In the RR+EC condition the student read the passage four times. During each passage reading, if the student hesitated on a word for more than 3 seconds or read the word incorrectly, the examiner said the word and had the student repeat the word three times. On the fourth reading, the examiner allowed the student to read the passage without interruption. Assessment results were based on the student's reading performance during the first minute of the fourth reading.

*Listening passage preview/repeated readings/error correction (LPP+RR+EC).* During the listening passage preview segment, the passage was read to the student while the student followed along with his or her finger. The experimenter observed the student to make certain that the student was following along. Next, the student read the passage three times. After each reading the student was told how long it took to read the passage. If the student hesitated on a word for more than 3 seconds or read the word incorrectly, the examiner said the word and had the student repeat the word three times. On the fourth reading the examiner allowed the student to read the passage without interruption. Assessment results are based on the students reading performance during the first minute of the fourth reading.

### *Experimental Design*

A BEA with a withdrawal and an alternating-treatments design (ATD) was used to compare the effects of preferred versus effective oral reading interventions. An ATD was used to compare the efficacy or acceptability of the selected instructional condition over time. The BEA was distinguished from the extended analysis by the duration (approximately 45 min in the BEA, 6 weeks in the extended analysis), the number of sessions per phases (approximately 6 in the BEA, 18-21 in the extended analysis), and the criteria used to evaluate effects. The BEA was completed prior to implementing the alternating-treatments design.

*Brief experimental analysis.* The BEA was implemented using a multielement design that included five conditions: baseline, RR, RR+EC, LPP+RR, and LPP+RR+EC. Conditions were presented in a randomized order for each participant. For the purposes of this study, a condition referred to the implementation of an explicit experimental procedure such as RR+EC, or LPP+RR+EC. With the exception of the baseline condition, a generalization probe consisting of a HCO passage was administered after each experimental procedure. When the intervention demonstrated a visible difference relative to baseline and the other instructional conditions, a minireversal consisting of a baseline condition was conducted. Baseline consisted of administering three reading probes and obtaining the median score of the three probes. The mini-withdrawal consisted of a baseline condition followed by the last effective experimental procedure (Daly et al., 1999). The BEA was conducted using second grade level materials. The instructional package that demonstrated the greatest improvement over baseline was

selected as the most effective. Two of the participants completed the BEA in one session while the remaining participant completed the BEA in two sessions.

*Alternating treatments phase.* An ATD was used to compare the condition demonstrated to be most effective by the BEA to the condition rated as most preferred by the participants. The order of conditions was determined randomly with the restriction that no one condition could be conducted more than three times sequentially. Data collection for conditions continued until ten sessions within each condition had been conducted.

#### *Dependent Variable*

ORF, calculated by measuring the number of words read correctly per minute (CWPM) was used on the instructional and the HCO generalization probes to measure the effect of the treatment interventions in both the brief experimental and extended analysis. ORF was determined in accordance with curriculum-based measurement procedures described by Shinn, 1989. In Shinn's procedures, the student is asked to read a passage aloud while the examiner records incorrect and correct responses (Appendix H). A word read correctly is defined as a word that is pronounced correctly in 3 s. Repetitions or self-corrections within 3 s are counted as words read correctly. A word is scored as an error if the student substitutes, mispronounces, omits, or does not read a word within 3 s. If the student hesitates for 3 s or struggles to pronounce a word, the student is told the word, and it is scored as an error. CWPM is then calculated by subtracting the number of errors by the total number of words read in 1 min.

### *Examiner Training and Interscorer Agreement*

The primary investigator conducted the BEA for the three participants. A trained observer completed the treatment integrity checklist for the BEA (See Appendix I and J). A total of twelve doctoral level students enrolled in a school psychology program were trained to assess treatment integrity during the BEA, implement the reading interventions during the extended analysis, and to assess CWPM and errors.

During the procedural training, each examiner was provided with a description of the BEA and alternating treatments phase as well as scripts outlining the specific steps for each intervention (See Appendices D, E, F, and G). The primary investigator provided corrective feedback to the examiners as well as additional opportunities for practice when necessary. Examiners were allowed to perform data collection procedures independently once they obtained 100% procedural integrity on the checklist criteria and once 90% or better interscorer agreement was obtained (ISA). ISA agreement during training of the examiners averaged 99%.

ISA, defined as the percentage of agreement of occurrences of the dependent variable (CWPM) between two data collectors, was collected for 31% of the sessions conducted during the extended analysis. ISA for the dependent variable was calculated by dividing the number of agreements of CWPM by the number of agreements plus disagreements and multiplying by 100. If at any time, ISA data fell below 80%, the observer was retrained in data collection.

ISA was assessed 7 times for Beth, representing 35% of the sessions, 8 times for Rick representing 33% of the sessions, and 5 times for Fred representing 25% of the sessions. ISA was above 99% for all participants.

*Procedural Integrity.* A trained observer observed 30% of the sessions to assess procedural integrity. Checklists were completed by the observer (Appendices D, E, F, and G). Procedural integrity was calculated by dividing the number of steps completed correctly by the total number of steps and multiplying by 100. The observer was instructed to immediately provide the examiner with corrective feedback if integrity fell below 100%. Procedural integrity was expected to be at 100% throughout the session. If procedural integrity fell below 100% at any time, the examiners were to be retrained to proficiency. Procedural integrity was 100% for all three participants.

*Data Analysis.* Data were graphed for all phases of the study. The analysis of data from the BEA and alternating treatments phase was presented for all participants with CWPM and errors per minute across conditions being graphically displayed. In the alternating treatments phase, visual analysis was used to determine changes in the dependent variable across conditions. The data were graphed to visually reveal divergence between conditions. Each condition was represented by an individual data series and tracked changes that occurred in that condition. A reading intervention would be considered more effective if it resulted in the greatest increase in ORF as compared to baseline, and resulted in divergent data above the comparison intervention.

## CHAPTER III

### RESULTS

#### Brief Experimental Analysis

The results of the brief experimental analysis for all participants are displayed in Figures 1, 2, and 3 in instructional and generalization passages. All participants demonstrated improvements in fluency in the instructional passages relative to baseline. Two of the three participants demonstrated improvements relative to baseline in at least one of the generalization conditions. Rick demonstrated improvement relative to baseline in the generalization condition for LPP/RR and RR/EC while Fred demonstrated improvements relative to baseline in the LPP/RR condition alone. Experimental control was established by means of a mini-withdrawal for all participants. The following results are based on ORF scores as well as visual analysis of the changes in levels of responding across conditions.

During baseline, Beth (Figure 1) read 76 CWPM. Results showed the LPP/RR condition resulted in the greatest improvement and, thus, was chosen as the most effective intervention in the comparison phase. During the BEA, the LPP/RR condition was readministered (preceded by a baseline condition) to Beth when her reading fluency increased after the initial administration of this condition. Experimental control was demonstrated by comparable gains after the second administration. Beth's greatest gains in the generalization passages were found in the RR condition. Although the LPP/RR condition resulted in the greatest improvement for Beth, she produced the greatest amount of errors in both the instructional ( $M = 7$  EPM) and the generalization

(M = 8 EPM) passages for this condition relative to the error rates in the other instructional (M = 6) and generalization (M = 6) conditions.

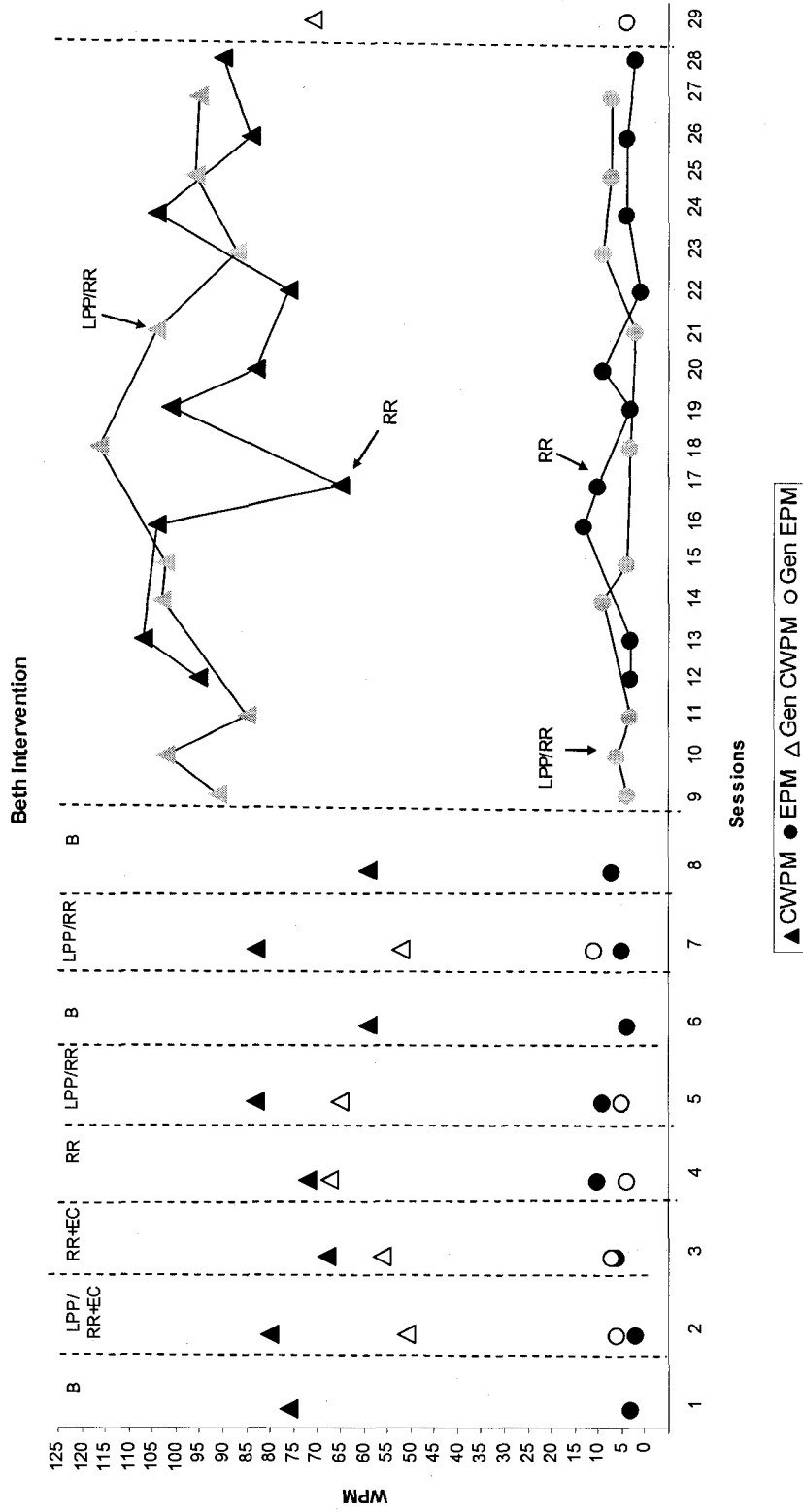


Figure 1. BEA and Extended Analysis for Beth



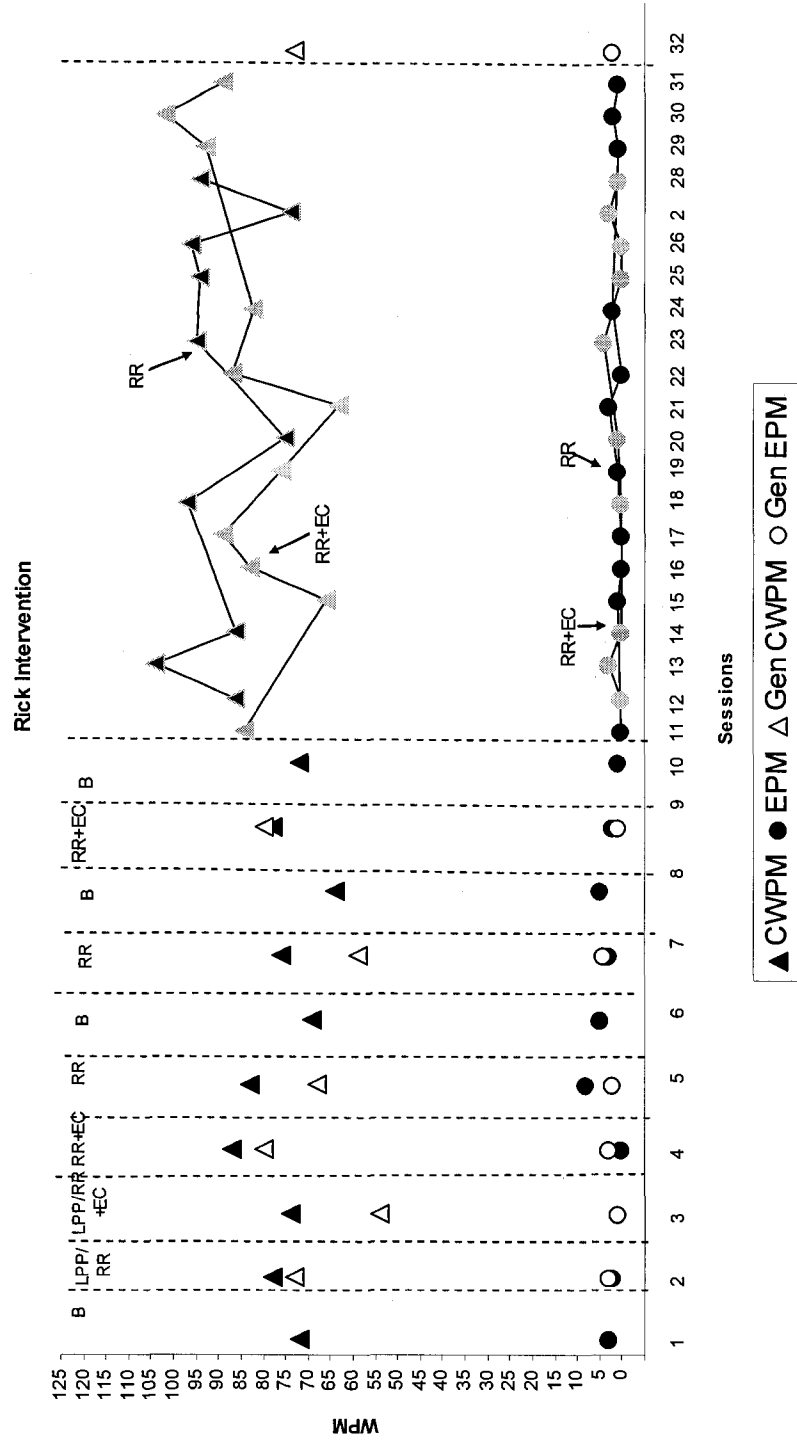


Figure 2. BEA and Extended Analysis for Rick

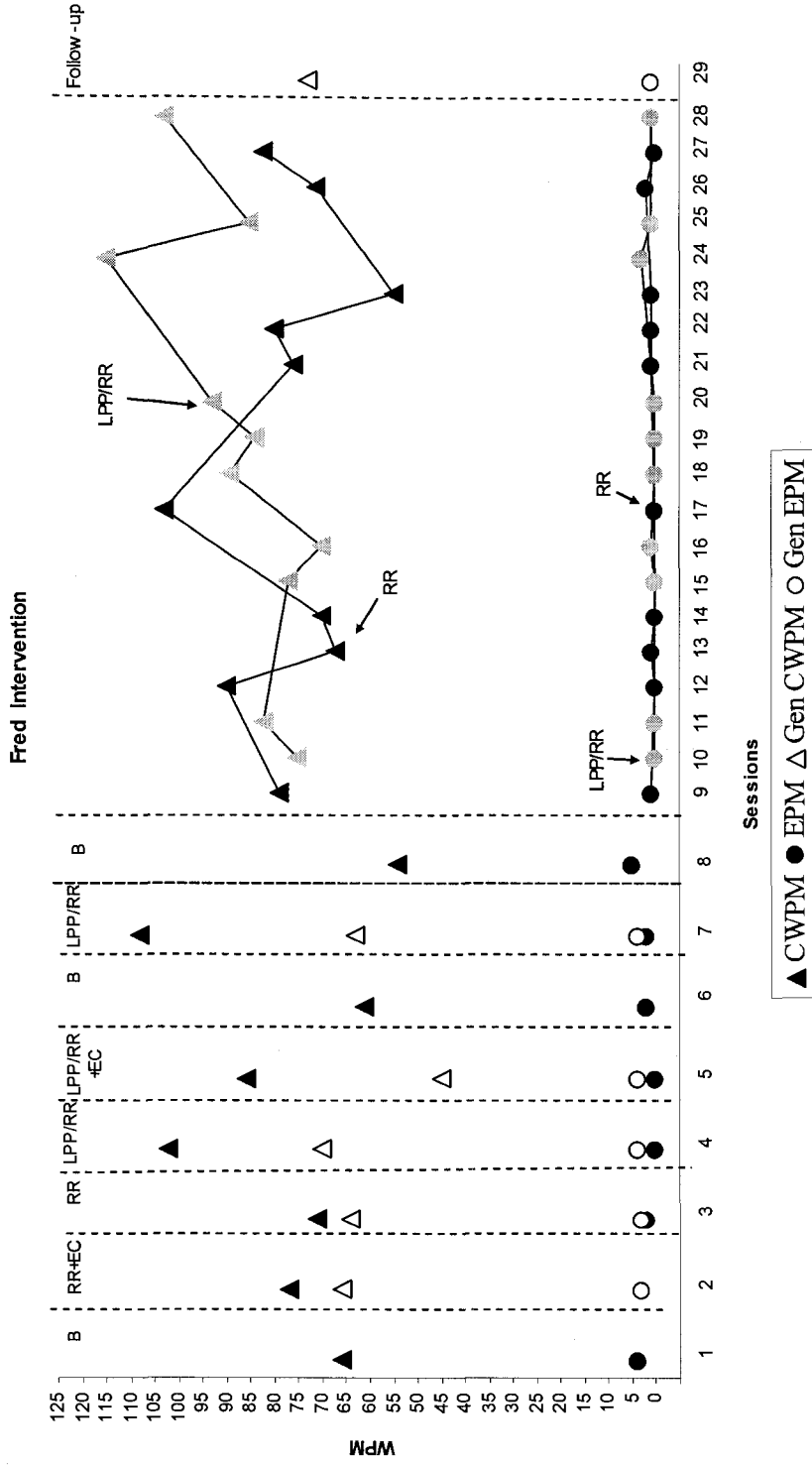


Figure 3. BEA and Extended Analysis for Fred

Rick (Figure 2) obtained a baseline of 72 CWPM. For Rick the greatest gains were demonstrated in the RR/EC condition. This condition was readministered (preceded by a baseline condition). As was the case with Beth, experimental control was demonstrated after the second administration of the RR/EC condition. RR/EC also resulted in the greatest gains among the generalization conditions. For both administrations of RR/EC in the instructional condition, Rick's error rate was relatively low ( $\underline{M} = 1$  EPM) compared to the error rate in the RR condition (8 EPM). The error rates during the RR/EC generalization passage were slightly higher ( $\underline{M} = 2$  EPM) but comparable to the error rates in the other generalization conditions ( $\underline{M} = 2.5$ ).

The RR condition was unnecessarily administered to Rick a second time. This was due to an oversight on the part of the examiner who should have readministered the RR/EC condition. A third baseline was obtained, and the condition that produced the greatest gains was administered. Despite this change in the protocol, experimental control was still obtained for the RR/EC condition. The BEA phase took place in one session for Fred and Rick and two sessions for Beth.

Fred (Figure 3) obtained a baseline ORF rate of 66 CWPM. For Fred, the LPP/RR condition resulted in the greatest improvement and, thus, was chosen as the most effective intervention in the comparison phase. During the experimental analysis, the LPP/RR condition was readministered (preceded by a baseline condition) to Fred when his ORF increased after the initial administration of this condition. Experimental control was demonstrated by comparable gains after the second administration. The LPP/RR condition also resulted in the greatest gains in the generalization passages for Fred. In regard to the error rate, Fred made the fewest amount of errors in the instructional

passages for the LPP/RR condition (0 EPM) and the greatest number of errors (4 EPM) in the generalization passages for the LPP/RR and LPP/RR conditions.

#### Preference Selection

After each participant had completed the four conditions they were given a brief (approximately 20 words) description of each intervention matched to the color of the probes used for the specific intervention. Participants were asked to rank the four interventions from most to least preferred as shown in Table 1. All three participants selected RR as their most preferred intervention.

#### Alternating-Treatments Design

Beth and Rick each received 21 sessions of intervention. Eleven of these sessions consisted of the empirically chosen (EC) intervention and 10 sessions consisted of the student preferred intervention (PC). Fred received 20 sessions of intervention, 10 sessions for each intervention. The extended analysis lasted 8 calendar weeks for Rick, 7 calendar weeks for Beth, and 5 calendar weeks Fred. With the exception of Rick, the empirically selected intervention resulted in the greatest mean CWPM in the extended analysis.

Beth's mean CWPM in the EC condition (LPP/RR) was 98 with a median of 99. The mean in the PC condition (RR) was 91 with a median of 92. The means of both the EC and the PC condition reflected an increase of 20 percent over baseline. Visual analysis of the data revealed initial convergence of the data. The data diverged for two alternations of the intervention only to overlap during the last six sessions. A follow up probe administered approximately one week after the extended analysis revealed a five word decrease from the initial baseline.

Table 1

## Participant's Rank Ordered Choice of Interventions

Participant	First Choice	Second Choice	Third Choice	Fourth Choice
Beth	RR	LPP/RR	RR/EC	LPP/RR/EC
Fred	RR	LPP/RR	LPP/RR/EC	RR/EC
Rick	RR	LPP/RR	LPP/RR/EC	RR/EC

Note. RR=Repeated Reading; PP/RR=Listening Passage Preview/Repeated Reading;  
 RR/EC = Repeated Reading Error Correction; LPP/RR/EC= Listening Passage  
 Preview/Repeated Reading/Error Correction.

Rick's mean CWPM in the EC condition (RR/EC) was 83 with a median of 84. The mean in the PC condition (RR) was 90 with a median of 94 reflecting an increase of 20 percent CWPM over baseline. Both conditions resulted in increased gains in ORF when compared to the baseline of 72 CWPM, although RR produced greater gains during the first three sets of alternating conditions. Visual analysis of the data revealed that RR was more successful overall for Rick, although the data overlapped notably after the first four sessions. The trend for the RR condition was initially quite variable with a noticeable increase at the end. Visual analysis of the RR/EC condition revealed considerable variability throughout the condition. A follow up probe administered approximately one week after the extended analysis revealed a one word increase over the initial baseline.

Fred's mean CWPM in the EC condition (LPP/RR) was 87 with a median of 85. The mean and median in the PC condition (RR) were both 77. Visual analysis of the data revealed considerable variability in the RR condition ending on an increasing trend. The LPP/RR condition, while initially stable, showed considerable variability for the last four sessions. Additionally, there was quite a bit of overlap between the conditions, although the data diverged for the last four alternations. A follow up probe administered approximately one week after the end of the extended analysis revealed a gain of seven words over the initial baseline.

## CHAPTER IV

### DISCUSSION

The reading skills of students nationwide are cause for concern in that only 32% of the nation's fourth graders demonstrated academic achievement at or above the Proficient level (NAEP, 2005). A review of the research (Torgesen, 2002) suggests that intensive intervention can bring the reading skills of students at-risk for reading for reading disabilities into the average range. Linking assessment to intervention is critical to the goal of achieving adequate reading skills for all students (Good et al., 1998). The use of a BEA, a systemic evaluation of two or more procedures, has been demonstrated to be an effective tool to use when selecting an evidence-based intervention (Daly et al., 1999; Eckert et al., 2002; Martens et al., 1999). Two studies (Noell et al., 2001; Van Auken et al., 2002) provided evidence of the treatment utility of BEA in the extended analysis.

In the case of struggling readers, the need for effective intervention is often confounded by motivational variables such as task engagement on the part of the reader (Gambrell et al., 2001; Snow et al., 1998; Stanovich, 1986; Torgesen, 2002). Although consistent results have not been demonstrated across all studies, the acceptability of an intervention as demonstrated by choice has been shown to increase correct responding (Moes, 1998; Williams & Collins, 1994). These studies suggest the relative contributions of effective and preferred interventions bear further investigating.

The purpose of the current study was to compare the effect of preferred reading fluency interventions relative to interventions that were demonstrated to be effective though the use of a BEA. Three participants were randomly selected based on ORF

scores placing them at risk (i.e. reading between 52 and 68 CWPM) for achieving the end of the year benchmark goal of 90 CWPM (Good et al., 2002). Four variations of repeated reading were presented during the experimental analysis. All participants demonstrated improvements in fluency in the instructional passages relative to baseline. Rick and Fred also demonstrated improvements relative to baseline in at least one of the generalization conditions. Experimental control was established by means of a mini-withdrawal for all participants.

For Beth and Fred, the LPP/RR condition resulted in the greatest improvement and, thus, was chosen as the most effective intervention in the comparison phase. Rick demonstrated the greatest gains in the RR/EC condition. This study supports the findings of previous studies (Carson & Eckert, 2003; Eckert et al., 2002; McComas et al., 1996) on the use of BEA to select reading interventions. Although all participants (with the exception of Beth in the RR/EC condition) demonstrated increases in CWPM during instructional conditions, different responses were found for the individual participants for the different conditions. This feature may be particularly helpful when selecting specific interventions for individual students.

Following the BEA, the students were asked to rank the interventions based on preference. All three participants selected RR as their most preferred intervention. This decision may have been due to the fact that of the four interventions, RR has the fewest components and required the least amount of effort on the part of the student. The preferred choice of reading interventions was then compared to the most effective intervention as identified by the BEA using an alternating-treatments design.



For Beth and Fred, the empirically chosen (EC) intervention was also the most effective intervention thus providing additional support for the treatment utility of BEA for implementing oral reading fluency interventions. For Rick, the preferred intervention (PC) was the most effective intervention. The means of both the EC and the PC condition in the extended analysis reflected an increase of 20% CWPM over baseline for Beth. The mean of the EC condition alone reflected an increase of 20% CWPM over baseline for Fred while the mean of the PC condition alone reflected an increase of 20% CWPM over baseline for Rick. Noell et al. (2001) evaluated an intervention as effective when the intervention resulted in a 20% increase over baseline in the brief analysis. While a 20% increase was observed only for Fred in the LPP/RR condition during the BEA, a 20% increase was observed for all three participants in the most effective condition in the extended analysis.

Visual analysis revealed considerable overlap between the conditions. Possible reasons for the lack of divergence between the data could be due to the similarity between the interventions in that all of the instructions conditions had a repeated reading component. Differences between the conditions may have been more noticeable if all the treatment components had been more varied or combined with consequences such as contingent reinforcement or performance feedback (e.g., Eckert et al., 2002).

A limitation when using an alternating-treatments design is the risk of multiple treatment interference and carryover effects. The current study attempted to minimize the possibility of multiple treatment interference by administering no more than one condition on any given day. Treatment conditions were randomized to control for

carryover effects. In spite of these efforts, both of these threats to validity could have occurred.

A greater concern presented in this study is the lack of generalization. While the BEA was shown to initially identify effective interventions for all participants, the improvements in reading were specific to the passages practiced during that specific session. Furthermore, comparison between the initial baseline and the follow up probe administered at the end of the extended analysis revealed a gain of one word for Rick, seven words for Fred and a loss of four words for Beth. According to Fuchs, Fuchs, Hamlett, Walz, and Germann (1993) expected growth for students in the second grade is 1.5 to 2.0 words per week. One possible explanation for the lack of gains may be the wide confidence interval associated with standard measurement of ORF (Christ, 2006).

Another possible limitation involved the failure to assess student choice throughout the extended analysis. Therefore, there is no way of knowing if preference changed over time. Previous studies (Moes, 1998; Williams & Collins, 1994) allowed participants to choose prior to each task. Further studies might provide more opportunities for participants to choose and, therefore, allow the researcher to make conclusions about effect of choice with a greater degree of confidence.

Although the student preferred intervention did not result in observable gains in CWPM when compared to empirically selected intervention for two of the three participants, the use of preferred interventions may have had cumulative benefits beyond the extended analysis. This study did not account for the effect of preferred interventions on task engagement or motivation persistence. Previous research has found a relationship between preference and choice and increased academic performance (Moes, 1998;

Williams & Collins, 1994) and task engagement (Dunlap et al. 1994, Killu, Clare & Im, 1999). If this study had shown that the participants demonstrate increased task engagement and persistence in the preferred condition, the preferred intervention may have resulted in greater gains over time. Given the importance of persistence in the development of reading skills, future research could examine the effect of combining scientifically based reading interventions with motivation building techniques such as choice. Rather than completing rating scales, student preference and choice is an observable indicator of their participation and one whose effect can be assessed during the intervention. Thirty years ago Wolf (1978) delivered a most persuasive rationale for addressing acceptability:

If the participants don't like the intervention they may avoid it, or run away, or complain loudly. And thus, society will be less likely to use our technology, no matter how potentially effective and efficient it might be (p. 206).

Given the current reading performance of America's students this rationale continues to be a compelling one for continued research on the influence of choice on academic performance.

## APPENDIX A

## PARENT CONSENT FORM

Dear Parent,

I am a doctoral student at the University of Southern Mississippi working under the direction of Dr. Joe Olmi, Ph.D. I am currently working on my doctoral dissertation looking at the effects of using reading interventions students prefer as opposed to reading interventions shown to be the most effective. As you may know, Petal Elementary School participates in a school wide screening of reading skills three times a year. You are receiving this form because your child was randomly chosen from a list of students whose reading scores from the second screening fell in the "Some Risk" category indicating the need for addition intervention.

With your permission, and if your child is willing, your child will be participating in my dissertation project. This will involve your child receiving a reading intervention. The reading intervention will involve your child's presence three to four times a week for approximately 20-30 minutes. The reading intervention will be targeted to increase your child's reading fluency, or rate of reading. Your child will not be removed during instruction of the core subjects of reading, language, and math.

As the primary investigator in this project, I will be presenting different reading interventions to your child and asking him to rank the interventions from most to least preferred. I will also be recording which of the interventions resulted in the greatest increase in his words read correctly. During the second portion of the study your child will be practice reading using either the most effective or most preferred interventions. All interventions have been shown to be effective in increasing students' rate of reading. I will also be training graduate students to administer these interventions and to conduct observations to make sure the interventions are administered correctly.

Your child may benefit from increased reading fluency. There are no negative side effects expected to occur in relation to this project. Even if you give your consent for this project, you may withdraw your child's participation at any time, without penalty or loss to yourself or your child.

If you agree to participate in this project, please read and sign the following page. If you have any questions, please contact me Debborah Smyth, or Dr. Olmi, at (601) 266-5255. This project and this consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to Ms. Betty Ann Morgan, at the Institutional Review Board Office, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406-5147, (601) 266-6820.

Sincerely,

---

Debborah E. Smyth, M.S., L.P.C.  
School Psychologist-in-Training

**TO BE COMPLETED BY THE PARENT**

Please read the following and sign:

*I have read the above statement and consent to my child's participation in the research project. I have had the purpose and procedures of the study explained to me and have had the opportunity to ask questions. I understand that my consent is voluntary and I may withdraw my participation at any time, without penalty or loss to my child or myself. I understand that my child will be receiving a reading intervention. I understand that my child's participation is confidential, as is the participation of my child's teacher.*

---

Signature of Parent

Date

## APPENDIX B

## TEACHER CONSENT FORM

Dear Teacher,

I am a doctoral student at the University of Southern Mississippi working under the direction of Dr. Joe Olmi, Ph.D. I am currently working on my doctoral dissertation comparing the effects of acceptability and effectiveness on student outcomes in the area of reading fluency. You are receiving this form because your student was randomly selected among the students whose scores fell within “At Risk” category on the DIBELS second benchmark screening indicating the need for additional intervention.

With your permission, and if your student is willing, your student will be participating in my dissertation project. This will involve your student being removed from the classroom three to four times a week for approximately 20-30 minutes to receive a reading intervention. The reading intervention will be targeted to increase your student’s reading fluency, or rate of reading. Your child will not be removed during instruction of the core subjects of reading, language, and math.

As the primary investigator in this project, I will be presenting different reading interventions to your student and asking him to rank the interventions from most to least preferred. I will also be recording which of the interventions resulted in the greatest increase in his words read correctly. During the second portion of the study your student will be practice reading using either the most effective or most preferred interventions. All interventions have been shown to be effective in increasing students’ rate of reading. I will also be training graduate students to administer these interventions and to conduct observations to make sure the interventions are administered correctly. Your student may

benefit from increased reading fluency. There are no negative side effects expected to occur in relation to this project.

If you agree to participate in this project, please read and sign the following page. If you have any questions, please contact me Deborah Smyth, or Dr. Olmi, at (601) 266-5255. This project and this consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to Ms. Betty Ann Morgan, at the Institutional Review Board Office, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406-5147, (601) 266-6820.

Sincerely,

---

Deborah E. Smyth, M.S., L.P.C.

School Psychologist-in-Training

**TO BE COMPLETED BY THE TEACHER**

Please read the following and sign:

*I have read the above statement and agree to participate in the research project. I have had the purpose and procedures of the study explained to me and have had the opportunity to ask questions. I understand that my consent is voluntary and I may withdraw my cooperation at any time, without penalty or loss to my student or myself. I also understand that the students participating in this study will be receiving a reading intervention three to four times a week for approximately six weeks. In addition, I understand that my student will not be removed during instruction in the core subjects of reading, language, and math. Lastly, I understand that my student's participation is confidential, as is my own participation.*

---

Signature of Teacher

Date



## APPENDIX C



The University of  
Southern Mississippi

Institutional Review Board

118 College Drive #5147  
Hattiesburg, MS 39406-0001  
Tel: 601.266.6820  
Fax: 601.266.5509  
www.usm.edu/irb

**HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE  
NOTICE OF COMMITTEE ACTION**

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.  
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **27022204**

PROJECT TITLE: **A Comparison of Reading Interventions Based on Preference to Reading Interventions Identified by Brief Experimental Analysis**

PROPOSED PROJECT DATES: **02/14/07 to 02/14/08**

PROJECT TYPE: **Dissertation or Thesis**

PRINCIPAL INVESTIGATORS: **Deborah Smyth**


COLLEGE/DIVISION: **College of Education & Psychology**

DEPARTMENT: **Psychology**

FUNDING AGENCY: **N/A**

HSPRC COMMITTEE ACTION: **Expedited Review Approval**

PERIOD OF APPROVAL: **02/22/07 to 02/21/08**

  
Lawrence A. Hosman, Ph.D.  
HSPRC Chair

2-27-07  
Date

## APPENDIX D

## REPEATED READINGS SCRIPT

Materials Checklist:

- Student Score Report Form
- Examiner Copy of the Instructional Passage
- Student Copy of the Instructional Passage
- Stopwatch
- Pen or Pencil
- Clipboard

Script:

- 1. Place the Examiner Copy of the Instructional Passage on the clipboard in front of you but shielded so that the student cannot see what you record.
- 2. Present the Student Copy of the Instructional Passage to the student, saying: "WE'RE GOING TO PRACTICE READING A STORY SEVERAL TIMES TO HELP YOU GET BETTER AT READING. EACH TIME I WILL TELL YOU HOW FAST YOU HAVE READ THE STORY. HERE IS THE STORY THAT I WOULD LIKE FOR YOU TO PRACTICE READING. READ THE STORY ALOUD. TRY TO READ EACH WORD. IF YOU COME TO A WORD YOU DON'T KNOW, I WILL TELL IT TO YOU. BE SURE TO DO YOUR BEST READING. DO YOU HAVE ANY QUESTIONS?"
- 3. Say "BEGIN!" and start the stopwatch when the student says the first word.
- 4. If the student hesitates on a word for more than three seconds or reads the word incorrectly, tell the student the word.
- 5. When the student has finished, say, "YOU READ THE STORY IN \_\_\_\_\_ MINUTES/SECONDS. TRY READING IT AGAIN AND I WILL TELL YOU HOW QUICKLY YOU READ THE STORY."
- 6. Say "BEGIN!" and start the stopwatch when the student says the first word.
- 7. If the student hesitates on a word for more than 3 seconds or reads the word incorrectly, tell the student the word and place a line (/) through it. Place a line (/) through any word that is missed (i.e., skipped, misread, transposed).

- 8. When the student has finished, say, “THIS TIME YOU READ THE STORY IN \_\_\_\_ MINUTES/SECONDS. TRY READING IT AGAIN AND I WILL TELL YOU HOW QUICKLY YOU READ THE STORY.”
- 9. Say “BEGIN!” and start the stopwatch when the student says the first word.
- 10. If the student hesitates on a word for more than three seconds or reads the word incorrectly, tell the student the word.
- 11. When the student has finished, say, “THIS TIME YOU READ THE STORY IN \_\_\_\_ MINUTES/SECONDS. TRY READING IT ONE LAST TIME AND I WILL TELL YOU HOW MANY WORDS YOU READ IN ONE MINUTE.
- 12. Say “BEGIN!” and start the stopwatch when the student says the first word. Follow along on the Examiner Copy, marking errors with a slash (/).
- 13. If the student hesitates on a word for more than three seconds, say the word and place a slash (/) through it. If the student reads a word incorrectly, place a slash (/) through it.
- 14. At the end of one minute, place a closed bracket (]) after the last word read BUT allow the student to finish reading the entire passage. Tell the student to stop reading at the end of the passage. Tell the student how many words he/she read correctly in one minute.
- 15. Record the number of words read correctly and errors on the Student Score Report Form.

## APPENDIX E

## REPEATED READINGS WITH ERROR CORRECTION SCRIPT

Materials Checklist:

- Student Score Report Form
- Examiner Copy of the Instructional Passage
- Student Copy of the Instructional Passage
- Stopwatch
- Pen or Pencil
- Clipboard
- Tape Recorder (Optional)
- Tape (Optional)

Script:

- 1. Place the Examiner Copy of the Instructional Passage on the clipboard in front of you but shielded so that the student cannot see what you record.
- 2. Present the Student Copy of the Instructional Passage to the student, saying: "WE'RE GOING TO PRACTICE READING A STORY A COUPLE OF TIMES TO HELP YOU GET BETTER AT READING. HERE IS THE STORY THAT I WOULD LIKE FOR YOU TO PRACTICE READING. READ THE STORY ALOUD. TRY TO READ EACH WORD. IF YOU COME TO A WORD YOU DON'T KNOW, I WILL TELL IT TO YOU. THEN, YOU WILL REPEAT THE WORD THREE TIMES. BE SURE TO DO YOUR BEST READING. DO YOU HAVE ANY QUESTIONS?"
- 3. Say "BEGIN!" and start the stopwatch when the student says the first word.
- 4. If the student hesitates on a word for more than three seconds or reads the word incorrectly, say the word aloud and have the student repeat the word three times.
- 5. When the student has finished reading the passage, say, "TRY READING IT ONE LAST TIME AND I WILL TELL YOU HOW MANY WORDS YOU READ IN ONE MINUTE."
- 6. Say "BEGIN!" and start the stopwatch when the student says the first word. Follow along on the Examiner Copy, marking errors with a slash (/). If the student hesitates on a word for three seconds, say the word and mark it with a slash. If the student reads a word incorrectly,

place a slash (/) through it. During the timed reading, the student does not have to repeat a misread word three times.

- 7. At the end of one minute, place a closed bracket (]) after the last word read BUT allow the student to finish reading the entire passage. Tell the student to stop reading at the end of the passage\*. Tell the student how many words he/she read correctly in one minute.
- 8. Record the number of words read correctly and errors on the Student Score Report Form.

## APPENDIX F

## LISTENING PASSAGE PREVIEW + REPEATED READINGS SCRIPT

**Materials Checklist:**

- Student Score Report Form
- Examiner Copy (4) of the Instructional Passage
- Student Copy of the Instructional Passage
- Stopwatch or Digital Timer
- Pen or Pencil
- Clipboard
- Tape Recorder (Optional)
- Tape (Optional)

**Script:**

- 1. Place the Examiner Copy of the Instructional Passage on the clipboard in front of you, but shielded so that the student cannot see what you record.
- 2. Present the Student Copy of the Instructional Passage to the student, saying: “HERE IS A STORY THAT I WOULD LIKE FOR YOU TO READ. HOWEVER, I AM GOING TO READ THE STORY TO YOU FIRST. PLEASE FOLLOW ALONG WITH YOUR FINGER, READING THE WORDS TO YOURSELF AS I SAY THEM. START AT THE TOP OF THE PAGE (point to the top of the page) AND GO ACROSS THE PAGE (demonstrate by pointing).”
- 3. Read the entire passage at a comfortable reading rate (approximately 130 words per minute), making sure that the student is following along with his or her finger.
- 4. When you have finished reading the passage for the student, say: “NOW I WANT YOU TO READ THE STORY SEVERAL TIMES ME. WHEN I SAY START, BEGIN READING AT THE TOP OF THE PAGE. IF YOU COME TO A WORD THAT YOU DO NOT KNOW, I WILL TELL IT TO YOU. BE SURE TO DO YOUR BEST READING. DO YOU HAVE ANY QUESTIONS?”
- 5. Say “BEGIN!” and start the stopwatch when the student says the first word.
- 6. If the student hesitates on a word for more than 3 seconds or reads the word incorrectly, tell the student the word and place a line (/)

through it. Place a line (/) through any word that is missed (i.e., skipped, misread, transposed).

- 7. At the end of one-minute, place a closed bracket (]) after the last word read and allow the student to finish reading the entire passage.
- 8. When the student has finished, say, “THIS TIME YOU READ THE STORY IN \_\_\_\_ MINUTES/SECONDS. TRY READING IT AGAIN AND I WILL TELL YOU HOW QUICKLY YOU READ THE STORY.”
- 9. Say “BEGIN!” and start the stopwatch when the student says the first word.
- 10. If the student hesitates on a word for more than three seconds or reads the word incorrectly, tell the student the word.
- 11. When the student has finished, say, “THIS TIME YOU READ THE STORY IN \_\_\_\_ MINUTES/SECONDS. TRY READING IT ONE LAST TIME AND I WILL TELL YOU HOW MANY WORDS YOU READ IN ONE MINUTE.
- 12. Say “BEGIN!” and start the stopwatch when the student says the first word. Follow along on the Examiner Copy, marking errors with a slash (/).
- 13. If the student hesitates on a word for more than three seconds, say the word and place a slash (/) through it. If the student reads a word incorrectly, place a slash (/) through it.
- 14. At the end of one minute, place a closed bracket (]) after the last word read BUT allow the student to finish reading the entire passage. Tell the student to stop reading at the end of the passage. Tell the student how many words he/she read correctly in one minute.
- 15. Record the number of words read correctly and errors on the Student Score Report Form.

## APPENDIX G

LISTENING PASSAGE PREVIEW+ REPEATED READINGS SCRIPT WITH  
ERROR CORRECTION SCRIPT**Materials Checklist:**

- Student Score Report Form
- Examiner Copy (4) of the Instructional Passage
- Student Copy of the Instructional Passage
- Stopwatch or Digital Timer
- Pen or Pencil
- Clipboard
- Tape Recorder (Optional)
- Tape (Optional)

**Script:**

- 1. Place the Examiner Copy of the Instructional Passage on the clipboard in front of you, but shielded so that the student cannot see what you record.
- 2. Present the Student Copy of the Instructional Passage to the student, saying: “HERE IS A STORY THAT I WOULD LIKE FOR YOU TO READ. HOWEVER, I AM GOING TO READ THE STORY TO YOU FIRST. PLEASE FOLLOW ALONG WITH YOUR FINGER, READING THE WORDS TO YOURSELF AS I SAY THEM. START AT THE TOP OF THE PAGE (point to the top of the page) AND GO ACROSS THE PAGE (demonstrate by pointing).”
- 3. Read the entire passage at a comfortable reading rate (approximately 130 words per minute), making sure that the student is following along with his or her finger.
- 4. When you have finished reading the passage for the student, say: “NOW I WANT YOU TO READ THE STORY SEVERAL TIMES ME. WHEN I SAY START, BEGIN READING AT THE TOP OF THE PAGE. IF YOU COME TO A WORD THAT YOU DO NOT KNOW, I WILL TELL IT TO YOU. BE SURE TO DO YOUR BEST READING. DO YOU HAVE ANY QUESTIONS?”
- 5. Say “BEGIN!” and start the stopwatch when the student says the first word.
- 6. If the student hesitates on a word for more than 3 seconds, say the word,



- have the student repeat the word three times, and place a line (/) through it. Place a line (/) through any word that is missed (i.e., skipped, misread, transposed).
- 7. At the end of one-minute, place a closed bracket (J) after the last word read and allow the student to finish reading the entire passage.
- 8. When the student completes the entire passage, count the number of words read correctly and errors made in one-minute.
- 9. Repeat the above procedure three times. For each administration, record the number of words read correctly and errors made in one-minute. After the final reading, tell the student the number of words he/she read correctly in one-minute for that reading.
- 10. Record the number of words read correctly and errors made (from the final reading) in one-minute on the Student Score Report Form.

## APPENDIX H

CURRICULUM-BASED MEASUREMENT PROCEDURES OF ORAL READING  
FLUENCY

A direct reading assessment involves administering a series of short oral reading probes. There are standard passages, but in general, use passages that come from the child's reading curriculum.

Information that you can obtain:

Correct Words per Minute (CWPM)

**Incorrect Words per Minute (ICWPM)**

General instructions:

1. Select level that corresponds to suggested placement. You will present 3 passages for each level assessed.
2. Place student copy in front of student. Have your own copy in front of you. Your copy should include numbered lines and comprehension questions. Do not allow student to see your copy.
3. Say: **“When I say ‘begin,’ start reading aloud at the top of this page. Read across the page [demonstrate by pointing]. Try to read each word. If you come to a word you don’t know, I’ll tell it to you. Be sure to do your best reading. Are there any questions?”** [pause here]
4. Say **“Begin”** and start your stopwatch. Follow along on your copy, marking incorrectly read or skipped words as outlined in the scoring procedures. When one min. has elapsed, make a slash (/) after the last word read.
5. Allow the student to finish reading the entire probe. When finished, present the comprehension questions. Record the student's answers.  
If a student reads very slowly or poorly, you may elect to stop the student after one minute due to potential frustration of the reader, time issues, etc.
6. Count the total number of words correct and the number of errors for each passage. Score the percent correct on comprehension questions. Record scores and identify median correct, median incorrect (both per min), and median comprehension for each level assessed.
7. Based on student performance, utilizing criteria for placement, decide if other levels must be assessed and move up or down as appropriate. If student's performance is within criteria for instructional placement, move up; if not, move down.
8. Continue to give probes until median score for at least one level is instructional **AND** the one above it is frustrational.

Often you will not get this exact pattern. Some students will have a long series of instructional levels. According to Shapiro (1996), after 3 consecutive instructional levels, it is unnecessary to continue further. The student's level is the highest instructional level given.

It is important to note that should a child not reach a satisfactory instructional level in ANY book of the basal reading series, an evaluation of pre-reading skills is needed.

Scoring:

As the student reads, mark the following errors:

1. Omissions: if the student leaves out the entire word (/)

If the student omits the entire line, redirect him/her to the line as soon as possible and count ONLY ONE error (not as an error for each word missed). Subtract the number of words skipped in the line from the total number of words read in the passage. If you cannot redirect the student, count only as one error, not as an error for each word.

2. Substitutions/Mispronunciations: if the student says the wrong word (\)

If the student mispronounces a proper noun (1<sup>st</sup> time only), count it as an error the 1<sup>st</sup> time and provide the correct pronunciation; accept as correct all subsequent presentations of the same noun.

If the student mispronounces a word, give the child the correct word and instruct them to go to the next word if they hesitate.

If the student deletes suffixes (e.g., -ed, -s) the deletion IS NOT counted as an error.

3. Additions/Insertions: if the student adds a word or words not in probe (/ between words)
4. Pauses/Hesitations: after 3 s (5 S?), supply word and count the pause as a error (P)
5. Transpositions: count as 1 error (~)

DO NOT COUNT THE FOLLOWING AS ERRORS:

1. Repetitions
2. Self-corrections: (circle if self-correct)

## APPENDIX I

## BRIEF EXPERIMENTAL ANALYSIS INTEGRITY CHECKLIST

**Materials Checklist:**

- Student Score Report Form
- Examiner Copy of the Instructional Passages
- Student Copy of the Instructional Passages
- Examiner Copy of the Generalization Passages
- Student Copy of the Generalization Passages
- Scripts for interventions.
- Stopwatch or Digital Timer
- Pen or Pencil
- Clipboard
- Tape Recorder (Optional)
- Tape (Optional)

**Script:**

- 1. Color-code the back of the student probes for each different condition except for the baseline probes.
- 2. Administer baseline condition at the beginning and end of the BEA.
- 3. Random order the interventions for each participant.
- 4. Administer the interventions according to the steps listed on the scripts.
- 5. When an intervention demonstrates a clearly visible difference relative to baseline and other instructional conditions, administer a baseline condition followed by the last effective treatment condition.
- 5. Administer a generalization probe after each intervention.
- 6. Record the number of words read correctly and errors made in one-minute on the Student Score Report Form.

## APPENDIX J

## STUDENT SCORE REPORT FORM

Date	Passage Name or Number	Number of Words Read Correctly in One- Minute	Number of Errors Made in One- Minute

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