META-ANALYSIS OF READING INTERVENTIONS FOR STUDENTS WITH LEARNING AND EMOTIONAL DISABILITIES

Francesca Jones, B.S., M. Ed.

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APPROVED:

Lyndal M. Bullock, Major Professor
William Camp, Minor Professor
Bertina Combes, Committee Member
Ronald Fritsch, Committee Member
Jon L. Young, Chair of the Department of Technology and Cognition
M. Jean Keller, Dean of the College of Education
Sandra L. Terrell, Dean of the Robert B. Toulouse School of Graduate Studies
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Developing effective literacy skill has become an increasingly critical skill in today’s information age. Students with emotional/behavioral disorders (E/BD) routinely lack these skills and are not being taught how to read effectively. The field of special education needs more comprehensive and specific information about how to most effectively teach reading skills to students with E/BD. When reading interventions are conducted using student with E/BD, the interventions are generally drawn from the LD field. The assumption is that the reading interventions that have worked with students with LD will work equally well with the E/BD population. This study performed a meta-analysis to examine whether reading interventions are equally effective on the E/BD and LD populations. In addition, it will examine whether the instruction mode (e.g., peer, self, or teacher directed), gender, or grade group affects the success of the intervention.

The meta-analysis found that the reading interventions for both disability groups had high effect sizes. In addition, neither disability group, teaching method, gender, nor grades were predictive of the variance in the effect size. These results indicate that reading programs that have been designed for students with LD are also effective for students with E/BD and furthermore, reading programs can improve the academic achievement of students with behavioral disorders. Recommendations for teacher training and future research are given based on these results.
In Memory of

Elizabeth Deborah Go
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CHAPTER 1

STATEMENT OF THE PROBLEM

Today’s society demands that its citizens be literate in order to hold jobs, earn a living, and be considered successful adults. These demands are far greater than those placed on the majority of literate individuals a quarter of a century ago. This escalation in required literacy skills creates even more grievous consequences for those who are illiterate. In the article, *Dyslexia and The New Science of Reading*, Kantrowitz, Underwood & Wingert (2000) state that mass literacy is a relatively new social goal. A hundred years ago, literacy was not required in order to earn a living, but in today’s Information Age, success depends on an individual’s ability to read well and understand increasingly complex material (Harris & Sipay, 1980).

Because of the rising importance of literacy skills, no single educational issue has garnered as much attention as the teaching of reading (Harris & Sipay, 1980; Levy & Chard, 2001). In the past several years, reading instruction has become the purview of such diverse groups as politicians, religious leaders, and educators. Unfortunately, in spite of the unprecedented degree of attention reading instruction has received, researchers are concerned that there remain entire populations of students for whom effective reading instruction is not an educational priority (Levy & Chard, 2001). For example, students with emotional and behavioral disorders (E/BD) routinely receive inadequate reading instruction
as such instruction does not seem to be a priority in their education (Gunter & Shores, 1994; Lane, 2004). The result of this inattention is students with E/BD continue to fall further behind despite society’s increasing demand for higher literacy skills.

It is well established that students with E/BD fare poorly, both socially and academically (Landrum, Tankersley, & Kauffman, 2003; Nelson & Johnson, 1996; U.S. Department of Education, 2001). Academic failure has long been recognized as a major characteristic of students with E/BD (Wehby, Falk, Barton-Arwood, Lane, & Cooley, 2003). Students with E/BD experience an increased likelihood that they will fail a course, receive lower grades, or be retained a grade when compared with other students with other disabilities (Gunter, Coutinho, & Cade, 2002; Landrum et al., 2003; Lane, 2004; Rock, Fessler, & Church, 1997; U.S. Department of Education, 2001). Sixteen percent of students with E/BD are required to repeat a grade, which is more than double the retention rate for general education students (Wagner, 1995). Simply improving the attendance of these students seems a great challenge as an estimated 43%-56% drop out of school, a rate almost twice that for all students with disabilities (Landrum et al., 2003). When examining adult post-school outcomes, students with E/BD are also more likely to be unemployed or underemployed (Mooney, Epstein, Reid, & Nelson, 2003; Sinclair, Forness, Alexson, 1985) and more than 40% of students with E/BD possess criminal records within three years of leaving school (Nelson & Johnson, 1996). In sum, students with E/BD do not face a very promising future if something is not done to help improve their outcomes.
Given the poor academic performance of students with E/BD and the negative outcomes associated with their poor academic performance, it is essential that the field of E/BD identify evidence-based instructional strategies to better serve this population (Lane, 2004). Speculation regarding the cause of the academic failure of many students with E/BD may include assumptions that educators do not have the tools to teach reading or other academic skills that these students are too busy acting-out for instruction to occur, or that students with E/BD simply do not respond to interventions intended to increase academic success. However, research demonstrates that academic instruction, specifically reading instruction, does yield positive outcomes for students with E/BD (Wehby et al., 2003). Effective academic instruction has the benefit of both increasing scholastic success and decreasing inappropriate behavior. In fact, engaging teaching can be one of the most effective behavioral interventions. No behavioral system, regardless of its complexity, will manage the behavior of students who are not engaged in productive and meaningful work (Reitz, 1994).

In order to improve their academic, behavioral, and long term outcomes; it is imperative that educators address the academic underachievement of students with E/BD (Mooney et al., 2003).

Though current research indicates that reading interventions generally lead to positive outcomes for students with E/BD, research in this area is still in its infancy. One area that is not yet clear is which instruction techniques are most effective and whether students with E/BD require something unique in their academic instruction. Although it is acknowledged that different instructional
strategies may be necessary for teaching academic skills to students with behavioral disorders (Hallahan & Kauffman, 1986), the interventions used in these studies are typically interventions that have been chosen because they have demonstrated some level of success for students with learning disabilities (LD). Most studies concerning academic interventions for students with E/BD are an extension of research from the field of learning disabilities. These research extensions are designed to determine whether the intervention will also be successful with students with E/BD. However, it is not clear from these studies whether reading interventions produce optimal success for students with E/BD, or whether they are similarly effective with both populations.

In order to examine whether reading interventions are as effective for students with E/BD as they are for students with LD, this study will conduct a meta-analysis of research that evaluates reading interventions for students with E/BD and LD with a single subject research design. The effectiveness of the interventions based on the population are compared, as well as the effectiveness based upon the intervention design (i.e., peer vs. teacher-directed).

Purpose of the Study

The purpose of this study is to perform a meta-analysis to examine current empirical research specific to reading interventions for students with LD as compared to reading interventions for students with E/BD. This study determined whether the effect sizes of the interventions differ within the populations or in the method of academic instruction (e.g., teacher or peer directed). Using a regression analysis, the independent variables of disability, grade, intervention
type and gender were used to determine if any are reliable predictors of the
dependant variables effects size or percent of non overlapping data.

Research Questions

The following research questions will guide this study:

1. What differences might exist in the average academic gains of students
   with behavioral disorders when compared to the average academic gains
   of students with learning disabilities in reading interventions?

2. In what way might differences in the average academic gains of students
   be affected who have been given reading interventions directed by peers,
   teachers, or self mediated?

3. In what way might differences in the average academic gains of students
   be affected by their grade group?

4. In what way might differences in the average academic gains of students
   be affected by their gender?

Significance of the Study

In order to improve educational outcomes for students with E/BD, it is
essential to understand the specific characteristics and academic needs of this
population (Trout, Nordness, Pierce, & Epstein, 2003). Although literature has
indicated that many, if not most, students with E/BD do not read at grade level
and many have a co-morbid learning disability, research has only recently begun
to focus on the effects of improved academic ability for students with E/BD. A
review of literature relevant to reading and students with E/BD revealed that
recent research has begun to evaluate academic achievement, specifically
reading skills. While these studies have been used to determine the effects of reading interventions for students with E/BD, the research does not indicate whether it is the most effective method. There is a need in the field to examine the results of the reading intervention research with students with E/BD so that school administrators, teachers, and parents can be provided the opportunity to make sound, objective, instructional decisions.

An awareness of academic underachievement in students with E/BD is critical for policymakers, researchers, and practitioners who are responsible for making important decisions regarding the use of educational and social resources, financial allocations, and teacher training programs for children and youth with E/BD. Understanding which reading programs work and which instructional methods are most effective is paramount to providing successful academic instruction to students with special needs. In addition, knowledge about specific academic interventions that have been successful with children with E/BD will facilitate informed and effective academic programming designed to alleviate the patterns of educational underachievement, which lead to life-long academic and social deficits (Epstein, Nelson, Trout & Mooney, 2004).

Studying the effectiveness of reading programs for students with E/BD and L/D has significance at the classroom, university, and policy-making levels. At the classroom and school levels, educational professionals can use this information to determine the effectiveness and success rates of various reading interventions. Researchers in higher education can continue to build on this knowledge base and develop programs that more effectively improve the
academic skills of students with E/BD. Policymakers can shape law and school policy to make schools safer and more successful by ensuring that the most valuable educational programs are used.

Limitations

One limitation of this study is that results of a meta-analysis are more generalized and broader than other methods of inquiry. Additionally, the population will be subject to the same limitations as each of the constituent studies. Another limitation is that this study will not include an analysis of organizational or environmental factors. The inclusion of primarily published journal articles may have weakened the external validity of the present study due to a tendency to publish only studies with significant positive effects.

Moreover, the meta-analysis was limited by the information provided in the studies. For example, the inclusion of primarily published journal articles may have weakened the external validity of the present study due to a tendency to publish only studies with significant positive effects. Additionally, when full results of effect size or means and standard deviations were not reported the effects size was not able to be determined therefore, not all studies were included in the final analysis.

One of the major limitations of single subject research is the small sample size. This limited sample size may be one reason that no more significant effects were found. Even though when combined the sample was large, because each individual study was small, the effect sizes are somewhat inflated and differences between variables may not be noted. Another analysis that included group
design research may have different findings that indicate more variance between dependant variables.

Definition of Terms

1. **Emotional/Behavioral Disorder (E/BD):** Refers to individuals who are identified under the Individuals with Disabilities Education Act (1997) and exhibit one or more of the following characteristics over a long period of time, and to a marked degree, which adversely affects educational performance: (a) an inability to learn that cannot be explained by intellectual, sensory, or health factors; (b) an inability to build or maintain satisfactory interpersonal relationships with peers and teachers; (c) inappropriate types of behaviors or feelings under normal conditions; (d) a general pervasive mood of unhappiness or depression; or (e) a tendency to develop physical symptoms, pains, or fears associated with personal or school problems. The term does not include children who are socially maladjusted, unless it is determined that they are emotionally disturbed. (45 C.F.R. 121a.5[b][8][1978])

2. **Learning Disability (LD):** Public Law 101-476, IDEA, defines a learning disability as a "disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written language, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell or to do mathematical calculations." The term "specific learning disability" means a disorder in one or more of the basic psychological processes involved in understanding or in using language,
spoken or written, which may manifest itself in an imperfect ability to listen, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

3. **Meta Analysis**: A meta-analysis is a systematic, quantitative approach to summarizing findings of a collection of independently conducted studies on a specific research problem. A meta-analysis combines a number of studies (usually conducted by a number of different researchers in a variety of educational contexts) to quantify the effect a given instructional approach has on a given outcome. By broadening the pool of data to include many different contexts (and increasing sample sizes), a better quantitative estimate can be made of how much a given instructional practice affects students. In meta-analysis, statistical analyses are carried out based on the published results of empirical studies surrounding specific research questions. One integrates the outcome into a combined super outcome. Meta-analysis can code study outcomes of characteristics (e.g., duration of intervention, or training methods) (Hox, 2002).

4. **Single-Subject Research**: Single-subject research is experimental research with the purpose of documenting causal or functional relationships between independent and dependant variables. Several critical features define this methodology; (a) individual participant is the unit of analysis; (b) operational descriptions of participants, settings and
the process by which participants are selected are required; (c) one or more dependant variables are defined and measured. Within the single subject design method, the subject acts as his or her own control. More than one subject can take part in a single subject design experiment, and if a number of single subject designs all show an effect of the treatment on a behavior, the effect can be more clearly demonstrated (e.g., multiple baseline and ABA designs) (Horner et al., 2005).

5. **Regression Analysis**: Regression is a method of analyzing the variability of a dependant variable by using information available on independent variables. It answers the question: what changed in the dependant variable correlate and can be explained by changes in the independent variable (Pedhazur, 1997).

6. **Peer-Mediated Intervention**: Peer-mediated instruction refers to an alternative teaching arrangement in which students implement or conduct teacher-selected instruction for other students, at its core, peer tutoring is an approach in which one child instructs another child in material selected by the teachers for instruction (Mathes & Fuchs, 1994). However, multiple concepts of peer tutoring exist (Ryan, Reid & Epstein, 2004); for example, not all peer tutors are "experts teaching novices", sometimes the students are randomly assigned, same-age classmates or same-aged low achievers. Any structured teaching method that pairs peers to instruct one another would constitute peer tutoring.
7. **Teacher-Mediated Intervention/Direct Teacher Instruction**: Teacher-mediated instruction refers to a comprehensive system of carefully sequenced, teachers directed methods of instruction for academic subjects that emphasizes the use of carefully sequenced steps that include demonstration, modeling, guided practice, and independent application (Carnine, Silbert, Kameenui, & Tarver, 2002; Walker, Colvin, & Ramsey, 1995).

8. **Self Monitoring**: Self monitoring is an instruction technique derived from the school of cognitive behavioral psychology. In education, this technique typically requires students to self-assess their academic productivity (i.e., the amount of academic responding) or accuracy (i.e., the number of correct responses) or their behavior (i.e., time on task). Students monitor and record their performance during specified time periods and then chart or graph daily data to create a record of ongoing progress and as an agent to create change (Rankin & Reid, 1995).

9. **Effect Size**: In general, the effect size tells how big of a difference or how large a correlation there is between groups. The dependent variables are measured by effect size which is the difference in mean outcomes of the treatment and control group divided by the standard deviation of the outcomes of the control group. For single subject designs this is moderated slightly, the primary index of increase or decrease in behavior in the present synthesis is the difference between the mean scores of the baseline (last three sessions) and the treatment phases (last three
sessions) divided by the pooled standard deviation (last three sessions of baseline and treatment) (Swanson & Sachse-Lee, 2000).

10. Percent of Non Overlapping Data (PND): The percent of non overlapping data (PND) summarizes single subject treatment of efficacy by calculating percent of treatment data points that do not overlap with the highest or lowest baseline data point (Campbell, 2004).
CHAPTER 2

REVIEW OF LITERATURE

This review of literature examined the research concerning the status of reading instruction for students with emotional and behavioral disorders (E/BD) and the learning disabilities (LD). Literature from 1975 to the present regarding reading interventions for students with E/BD were identified through computer database searching and hand searching of selected journals. Computerized searches were conducted using the Educational Resources Information Center (ERIC), Dissertations Abstract International, Ebsco Host, and PsychLit. The search descriptors used in this search were “behavioral disorders,” “emotional disorders,” “emotional and behavioral disorders,” and “learning disabilities,” pared with variations of “reading”, “literacy”, “effects” “peer tutoring” and “academic interventions” In addition, a hand search was conducted of the Journal of Behavioral Disorders, Journal of Special Education, Journal of Learning Disabilities, The Reading Research Quarterly, Journal of Educational Psychology, Learning Disability Quarterly, and Scientific Studies of Reading. Furthermore, the reference lists of other recently published research synthesis, meta-analyses, and reviews were carefully checked (e.g., Kroesbergen & Van Luit, 2003; Lane, 2004; Mooney, Epstein, Reid, & Nelson, 2003; Reid, Gonzalez, Nordness, Trout, & Epstein, 2004; Swanson & Sachse-Lee, 2000;).
This chapter summarizes the findings of the search and describes the co-morbidity of behavioral disorders and academic failure, with particular emphasis on the reading struggles of this population. The possible causal models of co-morbidity will be examined. A description of the current status of the E/BD classroom will follow. Next, a review of the status of research for students with learning disabilities will be presented. This review will conclude with research delineating known successful practices in the E/BD and LD classroom, specifically examining the effects of direct, teacher-led instruction, whole language instruction, peer-led instruction and self monitored instruction.

Co-morbidity of Behavioral Disorders and Academic Failure

The literature demonstrating the academic failure of students with E/BD is convincing. For decades, researchers have demonstrated that a relationship exists between low academic achievement and problem behavior (e.g., Hinshaw, 1992; Lane, Gresham & O'Shaugnessy, 2002; Rutter & Yule, 1970; Trout, Nordness, Pierce, & Epstein, 2003). While it is understood that students with E/BD exhibit inappropriate behavior, in addition, many students with E/BD also have intellectual and academic deficiencies (Bell & Young, 1990; Lane, 2004; Suter, 1993). In fact, the federal definition of E/BD includes academic underachievement of students as one of its key conditions and describes E/BD as “an inability to learn that cannot be explained by intellectual, sensory, or health factors” (IDEA, 1997; Mooney et al., 2003).

Historically, educators and researchers have focused on the behavioral, social and emotional problems of this population of students researching
interventions that improve the student’s social skills and reduce his/her acting out behavior. Unfortunately, this fixation on behavior alone leaves an entire set of potential problems unaddressed. Miller, Gunter, Venn, Hummel, & Wiley (2003) emphasize that students with E/BD often have academic deficits in addition to social and emotional problems. Therefore, the most efficient behavioral interventions will not be fully effective unless the student’s emotional, social and academic needs are all addressed.

Students with E/BD are at high risk of failing to master basic academic skills that are essential to future success. The preponderance of studies on academic performance have indicated that students with E/BD perform one to two years below grade level with academic difficulties emerging at an early age and persisting throughout their schooling (Coutinho, 1986; Kauffman, 2001; Reid et al., 2004; Rosenblatt & Rosenblatt, 1999). Nelson, Benner, Lane, & Smith demonstrated this in their 2004 study examining the academic achievement of 155 students with E/BD. They found that overall, the students exhibited significant academic achievement deficits across all content areas. This confirmed their hypothesis that low academic achievement is prevalent for students with E/BD.

More specifically, students with E/BD are frequently most challenged by reading and struggle more than average students in the population with this subject (Wehby, Falk, Barton-Arwood, & Colley, 2003). Like academic failure, the co-occurrence of reading failure and problem behavior has been well documented for many years (McEvoy, & Welker, 2000; Rock, Fessler, & Church,
One reason that this is likely is because classroom task attention correlates significantly with reading achievement and IQ (Forness & Esveldt, 1975). Moreover, reading failure has been attributed to internalizing behaviors such as depression and emotional difficulties (Gellert & Elbro, 1999; Stouthamer-Loeber, 2003), and externalizing behaviors, including those associated with conduct disorders (Wehby et al., 2003).

As early as 1970, a study by Rutter, Tizard, & Whitmore found that one-third of the same age children with severe reading difficulties were also identified as antisocial. In 1983, Forness, Bennett, and Tose evaluated 93 students, ages five to fifteen, who were receiving psychiatric services and found that one-third were under achieving in reading by more than a year. In a school setting, approximately 75% of students with E/BD were found to be almost one to ten years below grade level in reading (Kauffman, Cullinan, & Epstein, 1987). Most recently, Glassberg, Hooper, and Mattison (1999) stated the prevalence of reading disabilities in newly identified students with E/BD between the ages of six and sixteen was from 6-24%. Within this study, 50% of students with E/BD also met one or more of the criteria for LD (Glassberg et al., 1999). Although these studies differed in criteria and measurement of reading deficits and emotional disturbance, the co morbidity of reading deficits and E/BD appears to be above the levels attributed to chance (Barton-Arwood, 2003; Glassberg et al., 1999; Vaughn, Levy, Coleman, & Bos, 2002).
Four Theoretical Causal Models of Co-morbidity

As demonstrated previously, the concomitant relationship between academic achievement and E/BD has been repeatedly established in research (Gellert & Elbro, 1999; Rock et al., 1997; Wehby et al., 2003). Although students are often plagued by both disabilities, there is no clear reason why they are so often linked together. Researchers and educators are faced with a chicken and egg question of which came first, the inappropriate behavior or reading difficulties? There is a causal-relationship debate of whether learning disabilities are causing the inappropriate behaviors or the behaviors are preventing the student from learning. According to Gellert & Elbro (1999), the issue of which causes which is far from resolved.

Understanding the relationship between academic and behavior struggles is important. The nature of the causal link between E/BD and academic underachievement may play a critical role in the design of intervention programs for students in this population (Epstein et al., 2004; Lane et al., 2002). For example, if a clear causal relationship is found between the failure to develop early academic skills and the ensuing development of E/BD, then early interventions focusing on academics may prove to be more effective than those attempting to decrease or alter the problem behavior. Conversely, if the behavior exhibited by a child at an early age inhibits the attainment of early literacy skills then, the interventions should focus on intensely reducing the behaviors so learning is not interrupted.
There are four basic hypotheses or causal models suggested to elucidate the course and cause for the relationship between problem behavior and reading deficits (Barton-Arwood, 2003; Epstein et al., 2004; Hinshaw, 1992; Rutter & Yule, 1970). The first two hypotheses are unidirectional and causal, suggesting that one occurs first and causes the second. However, the two other possibilities do not suggest direction or cause but rather propose that the relationship between reading and behavior is interdependent.

**Hypothesis 1:** The first model of causation suggests that disruption from the problem behavior impedes the reading process (Hinshaw, 1992). This theory is basically that behaviors associated with E/BD cause academic underachievement. Based on this hypothesis, children begin their educational journey with problem behavior patterns already established (Barton-Arwood, 2003; Epstein et al., 2004), and these behaviors are a key disrupter of the reading process and interfere with the attainment of early academic skills and school related behaviors necessary for academic success. Therefore, the academic struggles of the student are clouded by their behavior making it easier for the student to avoid schoolwork, the teacher to reduce their interactions with the problem student (Gunter & Jack, 1994), and the process of learning to become neglected. The negative response garnered by the behaviors and subsequent academic failure exacerbates and perpetuates the problem. Hypothesis one requires that academic failure is addressed through early intervention of the behavior.
Hypothesis 2: Conversely, some hypothesize that a reading deficit needs to be present first and leads the student to act out and develop problem behaviors to mask the skill deficit (Rutter & Yule, 1970). This hypothesis theorizes that academic underachievement is a causal factor in E/BD. Along with the basic academic skill deficit, this model suggests that other factors related to academic underachievement, such as student demoralization and high frustration, negatively impact the student’s behavior due to feelings of inadequate academic abilities (Epstein et al., 2004). The struggles of the students with LD can become exacerbated when they struggle behaviorally. The same difficulties with language and pragmatics that lead to academic difficulty can interfere with their ability to explain themselves and present a sympathetic posture. Emotional problems often develop as a result of the failure to identify the underlying LD. The irony of this problem is that the student may be exhibiting deviant behaviors in order to disguise his/her inability to perform academically (Miller et al., 2003). The feelings of failure and the frustration of learning lead a student to develop acting out behavior to mask the academic struggle and cope with the school environment. Within this hypothesis, it is imperative that educators address the academic underachievement of students early in order to prevent problem behaviors from occurring.

Hypothesis 3: A third possibility is that predisposing factors in a child may lead to both reading and behavioral deficits (Barton-Arwood, 2004). Epstein et al. (2004), describe these as, “underlying etiological factors that cause the simultaneous occurrence of academic failure and E/BD”. These factors may be
directly related to the child (e.g., temperament, language delays) or arise from environmental situations (e.g., family stress, poverty) and any combination of them could lead a student to come to school with both the propensity to fail in reading and act out behaviorally and emotionally. Following this theoretical model, interventions would need to focus on the whole child and their home, school, and community environment to try and mediate their difficulties in school.

**Hypothesis 4:** The fourth hypothesis is related to a bi-directional or reciprocal relationship between reading and behavior struggles (Lane et al., 2002; Reid et al., 2004). This model holds that the two are interrelated in such a way that, though one does not cause the other, they both intensify the problems caused by the other. For example, when a child has behavior problems that exhibit before reading problems exhibits, the reading problem exacerbates the behavior struggles (Sanson, Prior, & Smart, 1996). Conversely, if the reading problems exhibit first, the frustration with the learning process will aggravate the behaviors of the student. In this model, both behavior and academic failure occur simultaneously with both factors directly influencing the degree of severity of the other (Epstein et al., 2004). Following this causal hypothesis, interventions would need to be whole-student focused and address both the academic and behavioral difficulties.

McGee, Williams, Share, Sanderson & Silva (1986) and McGee, Prior, Williams, Smart, & Sanson (2002) led longitudinal studies trying to track the relationship of the hypothesis. The 1986 study looked at the relationship between behavior and reading and the 2002 study examined attention deficit disorders
and reading. In both, the research teams concluded that there are dual pathways from early problem behaviors to later problem behaviors and reading difficulties. They found there was no single predictor of reading troubles or future behavior problems. Lane et al. (2002) concluded that it is highly unlikely that one causal model holds true for children at all educational levels. It is quite possible that different causal models may be found to be efficacious at different developmental periods.

Despite the development of the hypothesis, several key points may be gleaned from the literature. While a causal relationship between behavioral problems and academic underachievement has yet to be determined (Hinshaw, 1992), researchers have demonstrated that academic failure is one of the most powerful predictors of problem behavior and social failure (Maguin & Loeber, 1996; Reid et al. 2004). Also, the relationship between problem behavior and reading deficit appears to begin early and be above chance rates (Jorm, Share, Matthews, & McLean, 1986; McGee et al., 1986). Finally, one must note that not all students with problem behavior develop reading problems (Jorm et al., 1986).

Regardless of the causal relationship between the reading and behavior domains, it is clear that attention must be devoted to understanding how to better teach students with E/BD and, more broadly, students at risk for E/BD (Lane, 2004). Teaching academics in a class for students with E/BD is as critical and challenging as teaching social skills and appropriate behaviors. Equally, teaching social skills and problem solving to students with learning disorders is critical to prevent future problems. Ultimately, regardless of the cause of academic failure,
teachers of students with E/BD or LD must be skilled at addressing both the academic and behavioral needs of the student.

Current Status of the E/BD Classroom

Since it has been established that reading instruction is needed in E/BD classrooms, one must inquire whether this or any instruction is occurring and whether that instruction is effective in improving the academic skills of the students in those classes. Unfortunately, the literature reveals that little or no academic instruction is taking place in E/BD classrooms and teachers of students with E/BD do not seem to be adequately addressing the academic needs of their students (e.g., Lane, Gresham, & O’Shaugnessy, 2002; Lewis, 2004; Wehby, Symons, & Shores, 1995). In fact, Wehby et al. 1995 used the term, “the curriculum of non instruction” to describe the lack of teaching occurring in the E/BD classroom.

In an observational examination of the academics aspects of classrooms with students with E/BD, Steinberg and Knitzer (1992, p. 146) paint a very sad picture of the academic engagement in E/BD classrooms. The authors found “pervasive boredom and apathy” within the schoolrooms. They reported very few limited and ineffective strategies being implemented, instead, “worksheets and worksheets” filled the day. This study by Steinberg and Knitzer confirmed fears that students enrolled in classrooms exclusively designed for the E/BD had little direct instruction or learning occurring. Instead, these students worked individually on seatwork and had little adult interaction. The ultimate position of the researchers was that these students were not being effectively taught.
A 2000 study, conducted by Gunter, Denny & Venn found similar results. In addition to a lack of teaching, the authors found frustrated students who were not being helped when they could not figure out the work on their own. Gunter et al. reported that few, if any, academic modifications or adjustments were made to either material or instructional delivery for students with E/BD who were also struggling learners. In E/BD classrooms, often students sit and do individual work and worksheets and, instructionally, the teacher acts as an individual tutor. Very little direct instruction occurs, and the students learn few skills that they could generalize to a general education classroom.

Several other observational studies revealed that students most in need of reading intervention receive reading instruction for a relatively small percentage of their allocated instructional time sometimes engage in explicit reading instruction for only a few minutes each day (e.g., Chard & Kame‘enui, 2000; Haynes & Jenkins, 1986; Mathes & Fuchs, 1994). Researchers found that independent seatwork dominated the instructional time in E/BD classrooms (Levy & Vaughn, 2001; Mathes & Fuchs, 1994). A recent synthesis of observational studies conducted with students with LD and/or E/BD during reading instruction revealed that 40% or more of student’s instructional time in reading is spent doing independent seatwork (Vaughn et al., 2002).

Moreover, the literature demonstrates that for students with E/BD effective reading instruction is simply not a priority to many teachers (Levy & Chard, 2001). Although children with E/BD demonstrate significant difficulties in academic achievement, little attention has been placed on effective reading
instructional practices (Levy & Chard; Lewis, 2004). In some classrooms for students with E/BD, the teachers tend to be more focused on controlling behavior than on providing effective instruction (Levy & Vaughn, 2001; Reitz, 1994; Wehby et al., 1998). Often, considerable time in E/BD classrooms is spent on non-academic instruction, including time spent on ineffectively responding to student’s behavior. Ironically, since behavior is functionally related to the teaching environment (Lewis, 2004; Nelson & Johnson, 1996) in the E/BD teaching environments that are aversive and boring, students have an increased likelihood of reacting negatively to those environments. Based on the literature regarding the co-morbidity of academic failure and behavior, simply managing behavior may not improve behavior but may lead to more acting out conduct. Although theoretical research has effectively pinpointed that academic strategies are needed, too often, classroom application is critically suffering leaving the students even further behind academically. As a result, teachers are trying to only manage the student’s behavior and find they are not truly teaching or managing behavior effectively.

One reason for the failure to teach academics in the E/BD classroom is that a primary focus in intervention and teacher training for students with E/BD is on managing or changing children’s maladaptive social behaviors with much less attention being given to the significant relationship between E/BD and academic failure (Epstein et al., 2004; Lane, 2004). Historically, research, teacher preparation programs, and many of the interventions with which teachers are familiar are themselves focused primarily on behavior management. Therefore,
in addition to the struggling student in the E/BD classroom, often the E/BD teacher is a struggling teacher with limited skills in teaching academics.

While some teacher preparation programs provide a well rounded course of studies, many teacher training programs have not been thorough in preparing their teachers for the academic teaching of students with E/BD. In fact, a survey of textbooks used to prepare teachers of students with E/BD reveals that several contain little content pertaining to academics (Lane et al., 2002). While the authors note that there are some text books that devote more attention to academic intervention, many only contain one chapter covering the topic. Unfortunately, a teacher who is not skilled in pedagogy or behavior will likely face little success in a classroom of students with E/D.

The largest consequence of this limited training is that the teacher does not suffer alone, and a poor teacher can make the task of learning that much more difficult for the student (Sutherland, Alder, & Gunter, 2003). Sometimes, it is the manner in which the subject is presented that is aversive to the students (Gunter & Shores, 1994). The teacher may present the assignment or subject in such a way that perpetuates performance and skill deficits and continues the cycle of academic and behavioral struggle.

In sum, the present state of the some E/BD classrooms can be disheartening. While effective classrooms for students with E/BD do exist (Landrum et al., 2003), too often, as demonstrated by the studies conducted by Steinburg and Knitter (1992) and Gunter et al., (2000), classrooms for students with E/BD can be boring or out of control. Gunter and Shores (1994) admit that
struggling teachers can be a contributing cause student’s failure. The teachers are struggling to manage student behavior while neglecting their academics; consequently, students are not learning and are continuing in their pattern of failure.

Academic Instruction and Behavior

Since the E/BD class does not appear to be a very positive or stimulating environment, one might assume that effective instructional strategies for students with E/BD are not known. However, that is not the case. Research does exist that details the components of effective reading instruction for students as well as how to modify reading curriculum for students who learn differently (Landrum, Tankersley, & Kauffman, 2003; Walker, Ramsey, & Gresham, 2003). There is considerable current literature on reading interventions for students in the general population and those with LD. Unfortunately, academic interventions for the E/BD populations are somewhat unique in that they require consideration of both the learning and behavioral needs. Although some hold that the literature has failed to sufficiently identify effective academic interventions for students with E/BD (Gunter et al., 2002; Wehby et al., 2003), the research that does exist offers several promising interventions (Landrum et al., 2003; Reitz, 1994; Wehby et al., 2003). Unfortunately, too often these research based methods are not regularly used in the E/BD classroom.

One might assume that because of the pervasive academic failure of students with E/BD, these students simply do not respond to academic teaching or that there are no known methods of intervening academically. There are many
reasons that the focus in the E/BD classroom has remained on social or behavioral modification and not on improving the students reading or math achievement. First, there is a misconception that students must behave properly before they can be taught and therefore teaching never occurs because behavior is constantly being managed (Lane, 2004). Second, as mentioned above, teachers are unprepared to teach academics as their preparation programs focus primarily on behavior management and simply lack the knowledge and skills themselves (Epstein et al., 2004; Lane, 2004). Third, a student’s negative behavior can shape the teacher and lead to less instruction for that student, as the teacher will avoid that negative interaction (Sutherland et al., 2003; Wehby, Symons, Canale, & Go, 1999).

However, if one accepts that behavior management should be the primary focus of E/BD teachers, and no academic intervention is tried, then the academic and reading deficits of students with E/BD will only continue to increase over time and the poor outcomes will persist for students with E/BD (Coutinho, 1986). While no one questions the need to reduce the problem behaviors of students with E/BD, attention to the academic status of this population of students is important for several reasons (Barton-Arwood, 2003; Landrum et al., 2002). The presence of E/BD and reading deficits has the potential to severely impact grades, class placement, graduation, and adult adjustment (Sinclair et al., 1985). Addressing only behavioral deficits may not be sufficient to protect these students from severely negative outcomes.
Ironically, there is evidence to indicate that one of the most effective ways to reduce a student’s problem behavior is not to manage their behavior, but to improve their academic performance (Gunter & Jack, 1994; Lane et al., 2002; Lewis, 2004; Wehby et al., 2003). The literature demonstrates that behavioral and academic success is not independent: improved behavior is associated with academic success, which links to further improvement with behavior (Vaughn et al., 2002). Problem behavior is incompatible with academic achievement so, when students are taught using effective instructional procedures, their desirable behaviors increase while undesirable behaviors decrease (Gunter et al., 2000). The promise of this knowledge is that if teachers can successfully improve the academic performance of a student with E/BD there is a likely chance that his/her outcomes will improve.

Empirical studies that have been conducted support the premise that interventions targeting academic skill remediation have a collateral effect of reducing disruptive behavior. In 1984, Coie and Krehbiel assigned 40 students with behavioral problems to control and treatment conditions to determine if academic skill training affected both their academics and their behavior. The groups of students that received academic skills training were found to have significant improvement in both math and reading scores. Additionally, these students showed reduced off task behaviors and experienced increases in positive teacher attention. These results supported the hypothesis that the improved academics also improved behavior.
More recently, Lane, O’Shaughnessy, Lambros, Gresham, and Beebe-Frankenberger (2001) conducted a study of first grade students with behavioral disorders. They collected data on both academic and behavioral progress as these students were taught phonological awareness skills. They, too, found that the secondary intervention targeting academic skills resulted in positive collateral effects on behavior.

Other research demonstrates similar findings. Gunter et al., (2002) demonstrated that teachers who employ the empirically validated practices have demonstrated marked academic gains in their students as well as a reduction in undesirable behavior. Further, Gunter & Shores (1994) found that the disruptive behavior in the students participating in the study decreased markedly when the academic task was presented to the student using effective academic strategies.

It is clear that good academic instruction needs to become a more common form of behavior management. Walker, Colvin, & Ramsey (1995) state that quality instruction is one of the earliest proactive strategies that should be considered in classroom management. The first question that needs to be asked when students are exhibiting behavior problems is whether the student is being given good academic instruction (Lewis, 2004). Students with well targeted, challenging, and stimulating work will be more engaged and interested in the class and have fewer behavioral problems than students who remain under stimulated (Reitz, 1994).

As mentioned above, the research in the field of academic instruction for students with E/BD has not been extensive, but what has been done has been
promising (Landrum et al., 2003; Reitz, 1994; Wehby et al., 2003). The challenge is that examining how to address the academic instruction of students with E/BD demands attention to both the achievement problems that typify this population and the behavioral characteristics that probably further inhibit school performance (Landrum et al., 2003). However, the promising practices identified can give educators some knowledge about what to do to teach this population effective (Levy & Chard, 2001; Landrum et al., 2003.)

First of all, students must be engaged in learning and attending to the material being delivered (Brophy, 1973; Gunter et al., 2002; Levy & Chard, 2001). The teachers and students must have positive interactions and teachers must have high expectations (Brophy, 1973; Levy & Chard, 2001). Students must be given ample opportunities to respond to teachers and about 90% of those responses should be correct (Gunter et al., 2002; Sutherland et al., 2003). This means that the teacher must engage the student, know the level of the student, and provide questions and work that allow for high correct response rates. Finally, the teacher must provide corrective feedback and positive feedback to each student in an individualized manner (Sutherland et al., 2003).

However, the goal has to not simply be to get students engaged and positively interacting with the teachers, learning strategies must be designed to enhance the student’s ability to attend to instruction, retain information, and apply knowledge in appropriate contexts (Landrum et al., 2003). Levy and Chard (2001) reported that teachers who effectively addressed the needs of students at risk for reading failure (a) used small group instruction, (b) collaborated with
colleagues, (c) communicated with parents about student’s progress, (d) guided students in word identifying skills, and (e) received extensive professional development on instructional practices. All these methods have demonstrated some promise in increasing the academic skills of students with E/BD.

Current Knowledge in LD Research

Students with LD make up the largest group of students receiving special services (Ysseldyke, Algozzine, & Thurlow, 2000). More than 2 ½ million students in the United States are classified with a learning disability, a number that has increased dramatically since the late 1970s. In the past decade alone, the number of students classified with a learning disability increased 38%, and currently students identified with a learning disability represent 51% of all students with disabilities (Torgeson, 1998; U.S. Department of Education, 2001). According to the federal definition, students with learning disabilities have average or above average scores on intelligence tests but below average scores on at least one achievement test (U. S. Department of Education, 2001).

As with students with behavioral disorders, poor reading ability is a strong predictor of school failure, and the majority of students with learning disabilities—the largest high-incidence disability group in schools—experience difficulty with reading (Schmidt, Rozendal, & Greenman, 2002). Students with LD who do not successfully learn to read also face school failure and addition struggles in their adult life. With the current focus on reading in education, the needs of these students have arisen as an area of interest to many groups from educators to politicians.
Happily, the status of knowledge about reading intervention for students with learning and specifically reading disabilities is much more established than knowledge about the reading needs of students with E/BD. This is due to many factors not the least of which is, the knowledge of what disability the child faces was never in question. While with students with behavioral problems often mask their reading struggles, the problem is clearer for a child who only struggles with reading. Therefore, the research in this area has been more focused and comprehensive.

Research in reading disability began in the United States with the first published reports in 1916 but the first remedial reading programs were not initiated in schools until after World War II (Harris & Sipay, 1980). Serious research in the field began to rise after 1955 with the onset of the “cognitive revolution which shifted research focus from behaviorist learning theory to ward a study of the mediating role of mind and brain in determining human action (Foorman, Breier, & Fletcher, 2003;Torgeson, 1998). Again, in 1975, after the new Education for Handicapped Children Act (EHCA) (1975) was implemented research in reading was revitalized with a shift in focus to specific learning disabilities. Since then, many educational researchers have been focused on trying to find the most effective intervention for those with reading disabilities.

Despite the history of research, there has not been a consensus on the most effective strategies for students with learning disabilities. Debate has, and most likely will, continue to rage about whether direct, phonics based instruction or whole language instruction is more effective (Farstrup & Samuals, 2002;
Goral, 2001, Smith, 2003). In addition, the role of the teacher, peers as tutors, and the student himself/herself as a monitor of learning remains in question. Research is continually searching to delineate what is most effective.

In 1997, the federal government turned its sights to solidify what the state of research knowledge was for reading and for struggling readers in particular (Manzo, 2002; National Reading Panel, 2003). As a result, Congress called for the convening of what would become the National Institute of Child Health and Human Development (NICHD)’s National Reading Panel (NRP). When it was formed, members were chosen from the National Reading Institute and the Department of Education to review and summarize the current state of knowledge in reading research. The goal of the panel was to study the effectiveness of various approaches to teaching children how to read and to report on the best ways to apply those findings at school and at home (Manzo, 2002; NRP, 2003).

The NRP set out on its task but, acknowledging that time limitations and the enormous size of the task, restricted the scope of its work and decided to evaluate only control group studies that obtained measurable results and were reported in peer-reviewed journals. The research included in their analysis also had to be replicable and capable of being generalized to the population of students at large. The NRP organized it finding around five areas: alphabetics, fluency, and comprehension, teacher education in reading and computer technology in reading instruction. They concluded that that instruction for beginning readers is needed on several fronts including phonemic awareness,
phonics, fluency, reading comprehension and vocabulary. There was a focus on
the need for direct instruction based in phonics for students who were struggling
to read. The effectiveness of this type of instruction was very clear through the
meta-analysis. Further, explicit instruction in reading fluency and comprehension
proved to be effective in the research.

Admittedly, the NRP did not answer all questions about reading instruction
(Manzo, 2002). They were limited by time and resources. Additionally, some
people do not agree with their findings and found fault in their methodology. The
most widely criticized areas centers around the panels conclusions on the need
for direct instruction in phonics and phonemic awareness (Farstrup & Samuals,
2002; Krashem, 2002). There were criticisms that the panel only considered
quantitative studies and disregarded the contribution of qualitative research to
education. In addition, the quantitative studies they examined did not look at the
knowledge gained from single subject studies that had been performed.
Therefore, though held up as the standard of knowledge in reading research, the
NRP results are not without its limits and critics.

Other recent synthesis and overviews of research in reading for students
with learning disabilities indicate a few other factors that may impact the
effectiveness of a reading intervention. Early instruction and prevention seem to
be crucial in helping student overcome reading difficulties (Atkinson, Wilhite,
Frey, & Williams, 2002; Ehri, 2005; Farstrup & Samuals, 2002; Foorman et al.,
2003). These researches also primarily found that explicit instruction that was
based in alphabetics and phonics was most effective in changing the course of a
child’s reading struggles (Ehri, 2005; Atkinson et al., 2002).

Although researchers have knowledge about many reading strategies that
have demonstrated some effectiveness in helping both students with behavior
and learning difficulties, there are a few that the focus of the researchers
attentions in special education and are most commonly employed by schools
(Drecktrah & Chiang, 1997; Nelson & Johnson, 1996). These methods are the
direct instruction strategy introduced above, the whole language approach, and
also peer tutoring strategies to improve reading and self monitoring. Because of
their prominence, these effective teaching strategies merit further discussion.

**Direct instruction.** Among instructional strategies, direct instruction has
perhaps the richest empirical history in enhancing the academic achievement of
struggling learners (Foorman et al., 2003; Landrum et al., 2003). Over two
decades ago, research concerning the effective teaching in class settings
confirmed the effectiveness of explicit instruction and the importance of the
teacher as a critical manager of student behavior and academic learning time
(Brophy, 1979; Levy & Chard, 2001).

There are several features of the direct instruction method that make it
successful in the E/BD population. Walker et al., (1995) outline five features of
effective instruction (a) concepts are presented systematically, (b) skill
components are sequenced, (c) procedures of activity are specified, (d) sufficient
practice is prescribed, and (e) cumulative review and practice are built into the
curricula. One of the key advantages of direct instruction for low achieving
students is its emphasis on academic engagement and teacher attention (Landrum et al., 2003). This method requires that instruction is structured, predictable and involves positive interaction between teachers and student, all of which are components of a successful E/BD classroom.

In a 1996 study by Nelson & Johnson, the effects of direct instruction, cooperative learning, and independent learning were compared. Students were assigned to these three instructional conditions and data were collected on academic and behavioral outcomes. In the direct instruction condition, student displayed higher rates of on-task behavior and lower rates of disruptive behavior relative to the cooperative learning and independent learning conditions. The authors surmised that the results suggest that the instructional sequence underlying direct instruction practices reduces the disruptive behavior of students. Research by Pressley, Harris, and Marks (1992) has shown that many less capable students or those with reading problems need explicit and extensive instruction to learn such skills.

Yet, direct instruction is not a cure all and is not without its critics. A key part of the direct instruction method--and the one that draws the most criticism--is its strict adherence to a carefully worded script that teachers follow throughout the program (Goral, 2001). In addition, in order for direct instruction to be effective fidelity to the model must be high. Further, critics of direct instruction hold that it does not give students a context in which to learn reading or enough practice actually reading and that this can impede a students learning (Dracktrah & Chiang, 1997).
Whole language instruction. Whole language, on the other hand, takes a different approach to reading instruction. Instead of learning words by breaking down their phonetic components, children decode words by their context. At its root, whole language is a literature-based approach to reading, emphasizing comprehension over phonetic skills (Goral, 2001; Krashen, 2002). Children spend their time "doing" reading rather than endlessly drilling on spelling rules and letter combinations. In other words, they learn to read by reading. They also combine all the literacy skills such as writing in order to improve their reading (Brooks-Harper & Shelton, 2003).

Whole language was one of the more popular modes of instruction, particularly in the 1980’s (Smith, 2003). Whole language instruction took a huge dive in popularity after it was reported that California, which had adopted a whole language curriculum, had a significant drop in their reading test scores. This decrease in scores was attributed to the use of whole language and subsequently, whole language took a dive in popularity throughout the education community (Goral, 2001; Krashen, 2002). Some argue that this decrease was not due to whole language but other factors and that, despite the reinstitution of phonics programs in many schools, scores have not increased (Krashen, 2002).

Whole language was also primarily considered a teaching method to use with students who did not have special needs. However, some researchers have observed that the benefits of whole language have been documented for general education students and are beginning to emerge for students with learning disabilities (Dracktrah & Chiang, 1997). Zucker (1993) argues that the whole
language approach is good for student with disabilities because it focuses not on their deficits but capitalizes on their strengths and abilities. She argues that the approach of whole language to address all parts of literacy: reading, writing, listening, and speaking help the students with special needs in all areas in which deficits may occur and provides a more comprehensive approach to intervention.

For many, the choice between direct instruction of phonics and literature based whole language instruction is moot. Many teachers provide a combination of the phonics instruction of the direct instruction model and the use of literature and writing in the whole language model (Smith, 2003). However, in special education, because of the unique needs of the students and their inability to respond to typical instruction, direct instruction is more often the method of choice.

Peer tutoring. In addition to direct instruction, peer tutoring strategies have been recommended to facilitate academic, behavioral, and social gains for students with disabilities (Bell & Young, 1990; Fuchs & Mathes, 1991; Ryan, Reid, & Epstein, 2004). At its core, peer tutoring is an approach in which one child instructs another child in material selected by the teachers for instruction (Mathes & Fuchs, 1994). However, multiple concepts of peer tutoring exist (Ryan et al., 2004), for example, not all peer tutors are "experts", and sometimes the students are randomly assigned, same-age classmates or same-aged low achievers. In addition, the term "peer tutoring" often subsumes both cross-age and same-age tutoring. Therefore, the use of peer tutoring in classrooms can appear markedly different.
One of the benefits and goals of peer tutoring is simply to allow students more time to practice reading (Fuchs & Mathes, 1991). Additionally, because peer tutoring provides a format for peers to supervise academic responding, students can engage in direct practice of specific academic skills with opportunity for immediate error correction or reinforcement (Landrum et al., 2003). In reading, peer mediated instruction structures the environment to increase students' opportunities to actively engage in text and practice critical reading skills (Mathes & Fuchs, 1994). Peer tutoring then can allow students more time to practice skills and more direct instruction, albeit from peers, for specific academic skills.

Class-wide peer tutoring has been associated with increased academic performance and reduced behavior problems (Bell & Young, 1990). Mathes and Fuchs (1994) conducted a best evidence synthesis of 11 studies of peer tutoring in reading for students with disabilities. Their meta-analysis indicated that peer tutoring was an effective intervention for these students. Other research has found that students with disabilities can perform effectively in the role of tutor, a practice often referred to as reverse-role tutoring (Cook, Scruggs, Mastropieri, & Castro, 1986). Further, Walker, Ramsey, & Gresham (2003) have suggested the use of peer tutoring strategies in teaching social interaction skills in order to facilitate positive mental health and social competence outcomes.

Peer tutoring is a viable and seemingly effective academic instructional strategy for teaching students with LD and E/BD. Research thus far has been
very promising in showing both academic and behavioral gains for students with E/BD.

**Self management.** Another technique that has shown to be promising in research are self management techniques. Self management techniques such as self monitoring these techniques have been shown to increase time on task and academic performance of students with learning, behavior, and attention problems (Reid, 1996; Shimabukuro, Prater, Jenkins, & Edelen-Smith, 1999). Self monitoring of academic performance can increase productivity, accuracy and use of educational strategies (Shimabukuro et al., 1999). Self management techniques are derived from cognitive behavior modification.

It belongs to the family of cognitive-behavioral interventions because it incorporates elements of behavioral, cognitive, and developmental approaches to behavior change (Rankin & Reid, 1995). Self-monitoring uses an "inside-out" approach that attempts to alter one's behavior by changing one's thoughts. Self-monitoring can provide students with new ways of thinking about their behavior, and it reinforces the notion that behavior is under personal control rather than the control of others. This type of self-monitoring typically requires students to self-assess their academic productivity (i.e., the amount of academic responding) or accuracy (i.e., the number of correct responses). Students monitor and record their performance during specified time periods and then chart or graph daily data to create a record of ongoing progress. Students then self-record the results on tally sheets and graph their daily results in some form that provides an ongoing record of progress (Rankin & Reid, 1995). One of the benefits of self
monitoring is that it can help a student develop inner motivation instead of relying on exterior influences to change their behavior. It teaches them that they can control their own behavior and improve their own academic performance.

Conclusion

The literature demonstrates that students with E/BD struggle not only behaviorally, but also academically. Reading failure in particular is a pervasive problem for students with E/BD, even though the field does not yet know why these problems tend to exist simultaneously. What is clear is that, if we continue to identify these students, place them in restrictive environments, and address only their social and behavioral needs, we run the risk of further handicapping these students (Lane, 2004). Research demonstrates not only that increasing a students academic skills will improve their academic outcomes but also their behavioral outcomes.

Although addressing the instructional needs of the students with E/BD is a daunting task, several instructional strategies (e.g., direct instruction and peer tutoring) have been shown to be promising in demonstrating success in improving the academic and behavioral skills of these students. Researchers must continue to work to identify the most effective, efficient methods for instructing these students who clearly demonstrate academic and behavioral deficits (Lane, 2004).
CHAPTER 3

METHOD

The literature revealed that students with emotional and behavioral disorders (E/BD) continue to struggle in reading and other academic areas. Recently, research has been performed that examines the effectiveness of specific reading interventions for this population. Often, the curricula used for these interventions are chosen because the have been established to be effective for students with learning disabilities (LD) and researchers are attempting to determine whether they are also effective for students with E/BD. However, these reading interventions may not be equally effective for both populations. This meta-analysis of research studies examined whether the reading interventions that are being used for students with E/BD are equally effective as they were with students with LD. The purpose of this study was to investigate the potential difference in the effectiveness of reading interventions on students with learning disabilities and those with behavioral disorders. Further, the study examined whether there was a difference in the type of reading intervention that is used (i.e., does a peer-directed verses teacher-directed intervention result in different outcomes).

This chapter describes the method by which the meta-analysis was performed. First, the research questions that guided the study will be outlined. Next, a thorough description of the process of retrieving the studies is discussed followed by a description of the inclusion criteria utilized. Following this, the coding protocol for the studies is outlined. Finally, the researcher will explain the
strategy employed to analyze the data, concluding with a discussion of multiple regression analysis.

Research Questions

The following research questions will guide this study:

1. What differences might exist in the average academic gains of students with behavioral disorders when compared to the average academic gains of students with learning disabilities in reading interventions?

2. In what way might differences in the average academic gains of students be affected who have been given reading interventions directed by peers, teachers, or self mediated?

3. In what way might differences in the average academic gains of students be affected by their grade group?

4. In what way might differences in the average academic gains of students be affected by their gender?

Approval for the Study

The researcher received approval to conduct the study from the Institutional Review Board at the University of North Texas (see Appendix A).

Retrieval of Studies

Articles were identified through computer database searching and hand searching of selected journals. Computerized searches were conducted using the Educational Resources Information Center (ERIC), Dissertations Abstract International, Ebsco Host, and PsychLit. The search descriptors used in this
search were “behavioral disorders,” “emotional disorders,” “emotional and behavioral disorders,” and “learning disabilities,” pared with variations of “reading”, “literacy”, “effects” “per tutoring” and “academic interventions” In addition, a hand search was conducted of the Journal of Behavioral Disorders, Journal of Special Education, Journal of Learning Disabilities, The Reading Research Quarterly, Journal of Educational Psychology, Learning Disability Quarterly, and Scientific Studies of Reading. Furthermore, the reference lists of other recently published research synthesis, meta-analyses, and reviews were carefully checked (e.g., Kroesbergen & Van Luit, 2003; Lane, 2004; Mooney, Epstein, Reid, & Nelson, 2003; Reid, Gonzalez, Nordness, Trout, & Epstein, 2004; Swanson & Sachse-Lee, 2000). Using these tools, literature from 1975 to the present was reviewed. Operational definitions and a coding form were developed in order to record information contained in the articles.

Inclusion Criteria

In a meta-analysis, identification of all studies that meet eligibility criteria is critical to ensure the study is valid and reliable (Elbaum, Vaughn, Hughes, & Moody, 1999). To answer the research questions, a search procedure was undertaken to find as many studies as possible that reported on the empirical effectiveness of reading interventions for students with E/BD and LD and which met the inclusion criteria.

A two-stage process was used to identify studies. First, a comprehensive review of all published articles on reading research for students with E/BD was conducted. The articles were screened to verify that the qualifying articles
included a sample of students with E/BD and had reported academic achievement as a dependent variable. For the purpose of this review, participants were recognized as E/BD if the sample in the study was described as being school system identified as E/BD according to the Individuals with Disabilities Education Act (IDEA) (IDEA, 1997), clinically diagnosed as conduct disordered based on the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2000), or teacher identified through standardized behavior rating forms (Trout, Nordess, Pierce, & Epstein, 2003). Moreover, as a large percentage of students served in special education programs under E/BD disability present co-occurring conditions studies (Cullihan & Epstein, 2001; Kauffman, 2001), students diagnosed with E/BD and other disabilities (e.g., attention deficit hyperactivity disorder, conduct disorder) were included in the review (Trout et al., 2003). Additionally, studies were included that examined students who were considered at risk for E/BD. Finally, studies were included if the sample of children and youth were from special programs for students with E/BD such as residential treatment facilities or psychiatric hospitals (Trout et al., 2003).

This study was limited to including studies with single subject research designs as Mooney et al. (2003) found that single subject research has been the preferred design for conducting academic intervention research for students with EBD, accounting for 80% of all the research and nearly 95% of research conducted in the last 14 years. Furthermore, Horner et al. (2005), asserts, “A long and productive history exists in which single subject research has provided
useful information for the field of special education” (p.165). In addition, approximately one third of all data based interventions conducted on students with learning disabilities use single subject design (Swanson & Sachse-Lee, 2000).

Single subject research is experimental research with the purpose of documenting causal or functional relationships between independent and dependent variables. Horner et al. (2005) describe several critical features of this methodology. Single subject research must (a) consider the individual as the unit of analysis, (b) provide descriptions of the participants and settings, (c) delineate operationally dependent variables that are measured repeatedly, (d) utilize independent variables that are actively manipulated, and (e) employ a baseline or comparison condition. There are several types of single subject designs, the most common of which are (a) ABA design where there is an introduction and withdrawal of treatment, (b) multiple baseline which uses a staggered introduction of treatment, and (c) alternating treatment designs where the independent variable is manipulated across observation periods. Most typically, the individual serves as his/her own control in all these scenarios and experimental control is demonstrated when the design documents three demonstrations of the experimental effects at either three different points in time with a single participant or across different participants.

The second stage of the study selection was the comprehensive review of published articles on reading research for students with LD. For the purpose of this review, participants were recognized as LD if the sample in the study was
described as being school system identified as LD according to the IDEA (IDEA, 1997). Students were included also if they were diagnosed with dyslexia as defined by IDEA (IDEA, 1997). Studies were included if, (a) single subject research design was used, (b) students with LD were the participants, and (c) reading achievement was used as a dependent variable

Coding Protocol

A coding protocol was developed to record the characteristics of each article so a quantitative description of the findings and attributes could be conducted (see Appendix B). The coding protocol included the following information: (a) disability, (b) age, (c) gender, (e) student placement information when available, (f) type of intervention (e.g., peer, teacher led, self monitoring), (g) sample size, (h) effect size, and (i) percent of non-overlapping data (PND).

All categorical data were initially coded based on “dummy codes” created by the author. After the data were recorded based on these codes, the original codes created were replaced with criterion coding. This was done because dummy coding has some inherent limitations (O’Grady & Medoff, 1988). Dummy coding cannot deal with missing data or too many variables and can lead to some misleading results (Schumacker & Williams, 1993). As a result, criterion coding was used to eliminate some of these pitfalls, this process removes within cell variability and leaves only variability due to group differences. This is done by replacing each individuals score with the mean of the group to which the individual belongs.
Effect Size Calculation

Unless reported within the study, the effect size was calculated. Although there is no consensus on the ideal procedures for calculating effect size in single subject design studies (Campbell, 2004; Kromrey & Foster-Johnson, 1996), several techniques have been commonly used. One leading method is determining the mean shift which provides the researcher with a Cohen’s d type effect size (Kromrey & Foster-Johnson, 1996). This effect measures the shift in the mean from the initial phase of the study to the treatment phase and divides it by the standard deviation.

For this study, effect sizes calculation were based on the mean shift and modeled after the Swanson & Sachse-Lee (2000) meta-analysis. The effect was measured by using the last three sessions in the baseline and treatment phase so that a judgment could be made concerning participant improvement at the termination of an instructional phase. Thus, the primary index of increase or decrease in behavior in the present synthesis was the difference between the mean scores of the baseline (last three sessions) and the treatment phases (last three sessions) divided by the pooled standard deviation (last three sessions of baseline and treatment) (Swanson & Sachse-Lee, 2000).

From this formula, a Cohen’s d type effect was calculated for reading achievement. For the effect size index d, used to describe the strength of the correlation, the values of small, medium, and large are typically given as .2, .5, and .8 respectively (Kromrey & Foster-Johnson, 1996; Xu, 2005). Therefore, these measures of strength were applied to effects calculated from the studies.
In addition to the effect size mentioned above, another measurement of study effects was also used. The percent of non overlapping data (PND) is another measurement of effects size in single subject research (Kromrey & Foster-Johnson, 1996). The PND summarizes single subject treatment of efficacy by calculating percent of treatment data points that do not overlap with the highest or lowest baseline data point (Campbell, 2004). The PND was calculated based on the model in the meta-analysis by Scruggs, Mastropieri, Cook, & Escobar (1986). Treatment outcomes were calculated by computing the proportion of treatment data points which exceeded preceding baseline data points in the anticipated direction, this was done by looking at the three final data point in the baseline data. Then, for example, if a specific treatment phase consisted of 20 data points, 15 of which exceeded immediately preceding three baseline data points in the expected direction (e.g., an increase in compliance or a decrease in tantruming behavior), the resulting PND would be computed as 15/20=.75.

There was no recommended measure of strength for the PND as there are for the effect size, however, the author generally used the grading scale holding that PND over 80 were strong, between 60 and 70 were of medium strength, and under 60 were weak. This is how these measures of strength were applied to PND calculated from the studies.
Data Analysis Strategy

Meta-analysis is typically used as a way to summarize findings across a number of studies (Kavale, 2001). Meta-analyses integrate the findings of several studies to reveal the simpler patterns of relationships that underlie research literature. It offers several advantages over the traditional integration studies such as narrative literature reviews. Sindelar & Wilson (1984) explain that the advantages that meta-analysis offers are (a) increased objectivity, (b) freedom from arbitrary levels of statistical significance, and (c) potential to relate independent variables to effect size. Such analysis can correct for the distorting effects of sampling error, measurement error, and other artifacts that produce the illusion of conflicting findings among studies (Hunter & Schmidt, 2004).

This analysis was modeled after two single subject meta-analysis that had been published in peer reviewed journals concerning students with behavioral disorders and learning disabilities. The first, by Scruggs et al. (1986) analyzed 16 studies on treatment effects for students with conduct disorders using PND. The second, by Swanson & Sachse-Lee (2000) analyzed the effect sizes of 85 single subject studies to determine the effectiveness of academic interventions for students with learning disabilities. As a follow up to the main effects based on the mean effect size and PND, a regression analysis was used.

Although there have been previous meta-analyses that evaluated grouping practices in special education interventions studies (e.g., student pairs vs. small group instruction) (Elbaum et al., 1999), and some recent meta-analysis on the academic status of students with E/BD (Reid et al., 2004) none have
examined the differences between disability groups. Also, these studies compared only the study outcomes affect sizes to estimate the contributions of different variables, that is, the studies found a grand, combined effect size.

Regression is a method of analyzing the variability of a dependant variable by using information available on independent variables. It answers the question: what changed in the dependant variable correlate and can be explained by changes in the independent variable (Pedhazur, 1997). Regression analysis can take into account within and between group variance by coding the study characteristics, not simply their outcomes, and using these characteristics as potential variables to explain the differences in study outcomes (Hox, 2002). In this context, using regression analysis will allow for a more flexible, inclusive analysis (Kroesgergen & Van Luit, 2003).

For this statistical analysis, regression analyses will be run using the SPSS statistical package. This model assumes that study outcomes vary across studies not only because of random sampling effects but also because there may be real differences between studies. The statistical program will analyze the data to determine if any of the coded variables explain the variance between studies.
CHAPTER 4
RESULTS AND DISCUSSION

Articles were identified through computer database searching and hand searching of selected journals. Computerized searches were conducted using the Educational Resources Information Center (ERIC), Dissertations Abstract International, Ebsco Host, and PsychLit. The search descriptors used in this search were “behavioral disorders,” “emotional disorders,” “emotional and behavioral disorders,” and “learning disabilities,” pared with variations of “reading”, “literacy”, “direct instruction”, “peer tutoring” and “academic interventions” In addition, a hand search was conducted of the Journal of Behavioral Disorders, Journal of Special Education, Journal of Learning Disabilities, The Reading Research Quarterly, Journal of Educational Psychology, Journal of Applied Behavior Analysis, Learning Disabilities Quarterly, and Education and Treatment of Children. Furthermore, the reference lists of other recently published research synthesis, meta-analyses, and reviews were carefully checked (e.g., Kroesbergen & Van Luit, 2003; Lane, 2004; Mooney, Epstein, Reid, & Nelson, 2003; Reid, Gonzalez, Nordness, Trout, & Epstein, 2004; Swanson & Sachse-Lee, 2000;). Using these tools, literature from 1975 to the present was reviewed.
Effect Size Calculation

As mentioned in chapter three, unless reported within the study the effect size (ES) was calculated by the author. The mean shift effect was calculated using the means and standard deviations reported by the study author or by using the mean of the last three sessions of the baseline and the last three session of the treatment (Swanson & Sachse-Lee, 2000). The effect size was calculated based on the means and standard deviations reported. When no means or standard deviations were reported raw or graphical data were used for the necessary information. When no raw or graphical data were available the study was eliminated because no effect size could be calculated.

For the effect size index d, the values of small, medium, and large were given as .2, .5, and .8 respectively (Kromrey & Foster-Johnson, 1996). Also, the effectiveness of the reading intervention was measured differently for different studies. The measurement of academic growth in reading depended on whether the study was measuring fluency, comprehension, or decoding skills of the student. The main effect was calculated on the measures reported by the study author and varied with each study.

Percent Non-Overlapping Data

The percent of non-overlapping data (PND) summarizes single subject treatment of efficacy by calculating percent of treatment data points that do not overlap with the highest or lowest baseline data point (Campbell, 2004). Outcomes were calculated by computing the proportion of treatment data points
which exceeded preceding baseline data points in the anticipated direction. The study graphs were examined to find the trend in the last three baseline data point and measure what percentage of treatment points were above the baseline trend. The author determined that PND over 80 were strong, between 60 and 70 were of medium strength, and under 60 were weak. This is how these measures of strength were applied to PND calculated from the studies.

Characteristics of Studies

The abstracts were examined prior to study selection to eliminate studies that clearly did not meet the inclusion criteria. Single subject studies numbered 95. From those studies, several more were eliminated. One study was excluded because parents were teachers. Another was eliminated because it was performed with adult students. Additionally, several studies were eliminated because they did not report the required information to calculate the effects size or percent of overlapping data (PND). The final number of studies with effect sizes that were used to analyze results was 73, and the final number of studies from which the PND was calculated was 63. A complete list of study references is included in Appendix C.

Also, the PND was not able to be calculated from all the studies. From the 95 studies obtained, 63 provided enough information to calculate the PND. Many studies from which no PND were obtained still had a viable effect size measurement. However, if a study did not provide information to calculate an effect size of PND it was eliminated.
E/BD study characteristics. A frequent publication outlet for the E/BD studies found conducted with students were Behavioral Disorders with 7 or 26% coming from this journal. Another five, or 19% of the studies, were obtained from Education and Treatment of Children. Of the remaining studies, Journal of Emotional and Behavioral Disorders published three studies while School Psychology Review, Preventing School Failure, Child and Family Behavior Therapy, Psychology in Schools, Cognitive Therapy and Research each contributed two. Overall, the search yielded articles published in nine different journals, one Eric document and one dissertation. The average year of publication for studies of students with behavior disorders was 1994.

The means and standard deviations of the coded characteristics are reported in Table 1, and the frequency of study characteristics are presented in Table 2.
Table 1

*Means and Standard Deviations of Independent Variables*

<table>
<thead>
<tr>
<th>E/BD Studies</th>
<th>Mean (sd)</th>
<th>LD Studies</th>
<th>Mean (sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grades</td>
<td>2.17 (.90)</td>
<td>Grades</td>
<td>2.04 (.85)</td>
</tr>
<tr>
<td>Gender</td>
<td>1.67 (.98)</td>
<td>Gender</td>
<td>2.17 (1.02)</td>
</tr>
<tr>
<td>Placement</td>
<td>2.03 (1.42)</td>
<td>Placement</td>
<td>3.66 (1.83)</td>
</tr>
<tr>
<td>Intervention</td>
<td>1.52 (1.10)</td>
<td>Intervention</td>
<td>1.77 (1.55)</td>
</tr>
<tr>
<td>Sample Size</td>
<td>5.32 (4.32)</td>
<td>Sample Size</td>
<td>5.11 (2.47)</td>
</tr>
<tr>
<td>Research Design</td>
<td>1.96 (1.42)</td>
<td>Research Design</td>
<td>1.91 (1.17)</td>
</tr>
</tbody>
</table>
### Table 2

*Frequency of Study Features*

<table>
<thead>
<tr>
<th>Coding Categories</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Disability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = E/BD</td>
<td>28</td>
<td>37%</td>
</tr>
<tr>
<td>2 = LD</td>
<td>47</td>
<td>62%</td>
</tr>
<tr>
<td><strong>Grade Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = 1-3</td>
<td>12</td>
<td>19%</td>
</tr>
<tr>
<td>2 = 4-6</td>
<td>33</td>
<td>52%</td>
</tr>
<tr>
<td>3 = 7-9</td>
<td>12</td>
<td>19%</td>
</tr>
<tr>
<td>4 = 10-12</td>
<td>5</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = Male</td>
<td>24</td>
<td>38%</td>
</tr>
<tr>
<td>2 = Female</td>
<td>7</td>
<td>11%</td>
</tr>
<tr>
<td>3 = Both</td>
<td>28</td>
<td>44%</td>
</tr>
<tr>
<td><strong>Placement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = E/BD or LD self contained</td>
<td>19</td>
<td>30%</td>
</tr>
<tr>
<td>2 = Inclusion</td>
<td>1</td>
<td>01%</td>
</tr>
<tr>
<td>3 = E/BD/ alternative school</td>
<td>10</td>
<td>15%</td>
</tr>
<tr>
<td>4 = Resource room</td>
<td>17</td>
<td>26%</td>
</tr>
<tr>
<td>5 = General education class</td>
<td>9</td>
<td>14%</td>
</tr>
</tbody>
</table>

*(table continues)*
The population represented in the study was typical of the E/BD population at large. The most common grade group represented in studies for students with behavioral disorders was grade 4-6 (m=2.17; sd=.90). The studies were also predominately conducted with boys with only 9 of the 28 studies involving girls or a combination of boys and girls (m=1.67; sd=.98). A self-
contained class placement was the most common location for students with an alternative school placement as the second most common (m=2.03, sd=1.42). All this makes sense in light of the fact that students with E/BD are identified later, typically, around these grades and have a predominately male population placed in self contained classrooms.

Study characteristics were also interesting. Teacher directed interventions were most common occurring in 64% of the studies (N=18), with seven having peer tutoring and only two using self monitoring interventions. The average sample size for the studies was 5.32 students (sd=4.32). Additionally, the most common single subject design was multiple baseline (m=1.96, sd=1.42).

**LD study characteristics.** For the studies about students with Learning Disabilities, *Learning Disability Quarterly, Journal of Learning Disabilities, and Education and Treatment of Children* were the most common outlets with the three journals publishing 15 studies (32 %), 10 (21%), and 5 (10%) respectively. The additional studies were found in 10 other journals. Overall, the search yielded articles published in 13 different journals, one book chapter documents and one Eric document. The average year of publication for the studies found was 1990.

The means and standard deviations of the coded characteristics are reported in Table 1 but their results are summarized here. The population represented in these studies differed slightly from the E/BD studies. The most common grade group represented in studies for students with learning disabilities was also was grades 4-6 (m=2.04; sd.85). However, unlike the studies in the
E/BD population, the genders of the subjects in these studies were predominately mixed with most studies involving both boys and girls (m=2.17; sd=.85). Furthermore, unlike the E/BD studies, a resource class placement was the most common location for students with an alternative school placement as the second most common (m=3.66; sd=1.83).

The study characteristics demonstrated that, like students with E/BD, teacher directed interventions were most common occurring in 75% of the studies (N=34), with eight self monitoring interventions and only a few peer tutoring interventions (m=1.77; sd=1.55). The average sample size was 5.26 (sd=2.47). The most common single subject design was multiple baseline (m=1.90, sd=1.17).

Main Effects Analysis

One purpose of this study was to summarize single subject design intervention studies that include students with LD and E/BD. Effect sizes for 73 of studies were analyzed across disability domain, grade, gender, and intervention type (peer vs. teacher vs. self mediation). The PND was calculated for 63 and analyzed across disability domain, grade, gender, and intervention type. The main effects are presented in Table 3 but are summarized here.
Table 3

Main Effects Means and Standard Deviations

<table>
<thead>
<tr>
<th>Type of Study</th>
<th>Mean ES(sd)</th>
<th>Mean PND(sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Studies</td>
<td>2.59(3.28)</td>
<td>79.22(25.49)</td>
</tr>
<tr>
<td>Teacher direct</td>
<td>2.75(3.37)</td>
<td>8.31(24.71)</td>
</tr>
<tr>
<td>Peer tutoring</td>
<td>2.57(3.73)</td>
<td>61.32(33.00)</td>
</tr>
<tr>
<td>Self mediated</td>
<td>1.62(2.30)</td>
<td>71.44(9.96)</td>
</tr>
<tr>
<td>E/BD studies</td>
<td>2.41(3.28)</td>
<td>73.38(30.29)</td>
</tr>
<tr>
<td>Teacher direct</td>
<td>2.28(3.16)</td>
<td>81.73(17.65)</td>
</tr>
<tr>
<td>Peer tutoring</td>
<td>2.56(3.74)</td>
<td>70.47(19.88)</td>
</tr>
<tr>
<td>Self mediated</td>
<td>1.69(.79)</td>
<td>95(7.07)</td>
</tr>
<tr>
<td>LD studies</td>
<td>2.70(3.32)</td>
<td>82.90(22.01)</td>
</tr>
<tr>
<td>Teacher direct</td>
<td>2.91(2.48)</td>
<td>76.12(27.63)</td>
</tr>
<tr>
<td>Peer tutoring</td>
<td>1.24(.60)</td>
<td>89.5(.72)</td>
</tr>
<tr>
<td>Self mediated</td>
<td>1.76(2.27)</td>
<td>90.02(11.28)</td>
</tr>
</tbody>
</table>

For all 74 studies, the overall effect size was 2.59 (sd=3.28). The overall PND was 79.22 (sd=25.49). Among the studies, reading interventions appear to be quite effective with the average effect size being well over the minimum .80 recommendation of a strong effect. The percent of non overlapping data also was fairly high but was much more varied than the effect sizes with the standard
deviation of 25.49 indicating that studies had a wide variety of effectiveness reported in their PND.

For studies where the intervention was teacher directed, the average effect size was 2.75 (sd=3.37) and the average PND was 80.31(sd=24.71). For peer tutoring interventions, the average effect size was 2.57(sd=3.73) and the mean PND was 61.32(sd=33.0). For self mediated interventions, the average effect size was 1.62 (sd=2.30) and the PND was 71.44 (sd=9.96).

These results preliminarily indicate that the teacher directed interventions had the largest effects and the self mediated intervention the lowest. Conversely, the PND indicates that the self-mediated interventions were more effective than the peer tutoring interventions. This inconsistency could be due to the low n of each of these intervention groups, n=8 for both. It is yet to be determined whether this difference was statistically significant and regardless, both had very high effect sizes and relatively high PND averages.

For the 28 effect sizes culled from the E/BD studies, the mean adjusted effect size was 2.41 (sd=3.28). The average PND for the 28 studies was 73.38 (sd=30.29). For BD studies with teacher direction, the mean ES was 2.28 (sd=3.16) and the mean PND was 81.73 (sd=17.65). For peer mediated studies, the mean ES was 2.54(sd=3.74), and the mean PND was 70.47(sd=9.88). For self monitoring studies, the ES was 2.69 (sd=.79), and the mean PND was 95 (sd=7.07).

For the 45 effect sizes culled from the LD studies, the mean adjusted effect size (m=2.70, sd=3.32). The average PND for the 28 studies was 77.05.
For BD studies with teacher direction, the mean ES was 2.48 (sd=2.91), and the mean PND was 76.12 (sd=27.63). For peer mediated studies, the mean ES was 1.24 (sd=.60) and the mean PND was 89.5 (sd=.72). For self monitoring studies, the ES 1.76 (sd=2.27) was and the mean PND was 90.02 (sd=11.28).

When comparing the effects of the behavior studies and the learning studies the learning disability studies had a slightly higher effect size 2.70 versus 2.41. The PND was also very similar for the two disability groups. In order to determine whether this difference was statistically significant or whether any of these variables can explain the variance in the effect size scores, a regression analysis was conducted as a follow up to the main effects.

Regression Analysis

In order to determine the effect if the predictive variables of disability, grade group, and intervention type on the reading achievement; a multiple regression analysis was run using effect scores and PND and the dependant variables. The regression analysis was run in SPSS as well as correlations between the variables.

The first regression analysis of the variables and effect sizes yielded an effect size of .063 ($R^2$). This is interpreted as meaning that 6% of the variance in effect size can be explained by the independent variables measured. This is not a particularly noteworthy finding. Additionally, the F statistic, $F(1, 68) = .972$, $p = .43$, was not a statistically significant correlation at alpha level .05. The results of the analysis are summarized in Table 4.
Table 4

Summary of Regression Analysis for Reading Effect Size and PND

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>R</th>
<th>R²</th>
<th>F</th>
<th>P</th>
<th>Effect Size (η²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Effect</td>
<td>73</td>
<td>.251</td>
<td>.063</td>
<td>.972</td>
<td>.430</td>
<td>6.3%</td>
</tr>
<tr>
<td>PND</td>
<td>63</td>
<td>.242</td>
<td>.058</td>
<td>.792</td>
<td>.536</td>
<td>5.8%</td>
</tr>
</tbody>
</table>

Note: * indicate p<.05

The first regression analysis of the variables and PND yielded an effect size of .058 (R²). This is interpreted as meaning that 6 percent of the variance in effect size can be explained by the independent variables measured. This is not a particularly noteworthy finding. The multiple regression analyses showed that none of the prediction from the overall reading intervention effect sizes reached the statistical significance (i.e., F(1, 72) = .792, p = .536). Again, this was not a statistically significant correlation at alpha level .05. The results of the analysis are summarized in Table 4.

Although it was determined that all the independent variables combined did not strongly predict the effect size of reading interventions, the strength of individual predictors was still examined. In order to determine which variables had the most predictive strength, one must look at both the beta weights (Thompson, 1992). By looking at the beta weights, one can determine the proportion of the variance (ŷ) explained by the individual predictors.

The beta weights show that the strongest predictor of reading effect size was intervention type with a beta weight of .195 (see Table 5). However, this
predictor was still not statistically significant. These results indicate that though teacher directed interventions most strongly influenced the effect size of a study, the correlation was not strong enough to be statistically significant.

Table 5

*Summary of Beta Weights for Independent Variables*

<table>
<thead>
<tr>
<th></th>
<th>Effect Size β</th>
<th>F</th>
<th>PND β</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disability</td>
<td>.076</td>
<td>.562</td>
<td>.163</td>
<td>.241</td>
</tr>
<tr>
<td>Grade</td>
<td>.114</td>
<td>.367</td>
<td>.041</td>
<td>.765</td>
</tr>
<tr>
<td>Intervention</td>
<td>.195</td>
<td>.136</td>
<td>.068</td>
<td>.625</td>
</tr>
<tr>
<td>Gender</td>
<td>.114</td>
<td>.377</td>
<td>.140</td>
<td>.309</td>
</tr>
</tbody>
</table>

Discussion

*Main effects.* Overall the effects of intervention research are large with a mean effect size of 2.59 and demonstrate that intervening with a student’s reading education can be very effective. The reading interventions that researchers are implementing are working. Moreover, the results also indicate that what is working to teach reading to students with learning disabilities (ES: 2.70) also works for students with BD (ES=2.41). The average effect sizes of the two populations demonstrated was no real difference in the effect sizes in the studies with students with E/BD and LD.
The main effects also indicated that the slightly more effective method for intervention was reading instruction that was directed by the teacher (ES=2.75), though there was not a large difference between the average effect sizes. Peer tutoring programs (ES=2.57) and self monitoring (ES=1.62) methods are demonstrated to also have significant effects. Whole language interventions were not found in any intervention due possibly to the fact that special education has not often adopted the whole language interventions and research done on whole language interventions has been primarily qualitative.

Regression effects. The regression analysis performed allowed the researcher to answer the specific research questions.

1. What differences might exist in the average academic gains of students with behavioral disorders when compared to the average academic gains of students with learning disabilities in reading interventions? The regression analysis Beta weights (β= .076, F=.562) revealed that disability type was not predictive of variance in the effect size or PND. There was no statistical significant difference between the reading effects of students with LD and those with E/BD. As the main effects also revealed, the reading interventions work equally well with both populations.

2. In what way might differences in the average academic gains of students be affected who have been given reading interventions directed by peers, teachers, or self mediated? This question was designed to investigate the specific type of intervention and to determine whether the type of intervention
influences the effectiveness of the intervention. The beta weights (β) for intervention type (β=.195, f=.136) culled from the regression analysis indicated that there was no significant difference in intervention type. In other words, the type of intervention, whether direct instruction, peer tutoring, or self mediation, did not predict how effective the intervention would be.

3. Similarly, the research question was designed to determine whether differences in the average academic gains of students might be affected by their grade group? In the regression analysis, the beta weight (β) (β=.114, F=.367) demonstrated that the grade of the subjects was not predictive of the effectiveness of an intervention. The reading interventions seemed to work equally well with all grades of students.

4. Finally, the research answered the question in what way might differences in the average academic gains of students be affected by their gender. Again, the beta weight (β) (β=.114, F=.377) demonstrated that gender could reliably predict change in the effects of an intervention. Therefore, whether the subjects consisted of solely boys, girls, or a mix of both did not help explain the variance in the effect size of the intervention.

In sum, the regression analysis demonstrated that neither disability group, grade group, gender or intervention type could significantly predict how well an intervention would perform or the strength of its effects. This was an interesting finding, if only, in that it showed that interventions for students with LD, thus far, have worked equally well for students with E/BD. Although teacher-directed interventions had slightly more predictive weight in its correlation, this prediction
was not statistically significant. All three intervention types were effective and none led to a statistically significant difference in effect size.

One note from the analysis was that the regression results for the reading effects size measurement and PND measurement were very similar, though the effect size measurement was slightly more effective in predicting the effects. This indicated that both were similar measures of study effects and both were valid measures of study usefulness.
CHAPTER 5

IMPLIEDATIONS AND RECOMMENDATIONS

It is recognized that academic deficits often accompany behavioral disorders. Students with emotional and behavioral disorders (E/BD) are frequently most challenged by reading and struggle more than average students in the population with this subject (Wehby, Falk, Barton-Arwood, Colley, 2003). Like academic failure, the co-occurrence of reading failure and problem behavior has been well documented for many years (McEvoy & Welker, 2000; Rock, Fessler, & Church, 1997). Although the underlying cause and relationship between reading failure and behavior struggles remains unclear, it is clear that a strong correlation exists between the two.

Preliminary research has indicated that students who were able to improve their reading also improved their behavior and were more successful in school. In order to help students with behavior disorders improve both academically and behaviorally, effective reading interventions must be identified and implemented. Thus far, reading intervention research for students with behavioral disorders has generally used the same techniques that have been demonstrated to be effective for students with learning disabilities. Questions remained about whether these interventions were equally effective for both populations or whether students with behavioral disorders would need an additional component in their reading intervention, perhaps related to problem solving or social skills.
Additionally, it has not been determined in research whether the type of intervention used with the E/BD population changes the effectiveness of the intervention. Teacher directed, peer tutoring, and self monitoring interventions are all popular in learning disabilities reading interventions and it is not clear whether one type of intervention might be more effective for students with learning disabilities (LD) or E/BD.

This study conducted a meta-analysis of single subject research of reading interventions for students with LD and E/BD. Effects sizes on the change in reading scores and the PND of change from baseline scores to intervention scores were calculated to answer the research questions. Finally, a regression analysis was run to determine whether the disability type, intervention type, or grade group of the student could explain some of the variance within the effects size or PND measurement.

Implications for Practice

The promising outcomes of this study and the review of the research literature indicate that teachers of students with E/BD need to be concerned about the reading skills and literacy level of their students as well as their social and behavioral skills. This study indicates that reading programs and interventions that have been demonstrated to work with students with learning disabilities can have similar effects at improving the reading skills of students with E/BD. The implications for practice are clear; reading achievement for students with E/BD can be improved by instructing students using known effective reading interventions.
Additionally, this study indicated that there are several instructional methods that can be effective (e.g., direct instruction, peer mediation, self monitoring). In fact, a combination of the three the programs examined in the study might provide the best outcomes. All three interventions used in the studies demonstrated positive outcomes for students with E/BD in the meta-analysis.

Recommendations for Training

The outcome of this study, that reading interventions work equally well with LD and E/BD populations, is useful and pertinent to teacher preparation programs. Teachers of students with E/BD still do not consider academic deficits a priority and focus mainly on social or behavioral issues. Potential teachers need to be educated about the academic and behavioral needs of their students and how to intervene with them in both areas. Teachers in training programs, whether undergraduate, post graduate, or alternative certification, need to be informed about the need for and the effectiveness of reading programs for students with E/BD. Teachers of students with E/BD need to commit to provide behavioral AND academic support to their students.

This study may indicate that there needs to be greater collaboration in training programs so that the intervention techniques being taught to teachers of students with LD can also be taught to those of students with E/BD. As demonstrated by the meta-analysis, the reading interventions that teachers learn about and use for students with LD can be useful in helping the reading skills of students with E/BD. Therefore, the training programs should work together to
educate both populations of teachers on these effective techniques.

Collaboration between these two special education fields may lead to improved education for many students in special education.

Recommendations for Research

This study provided some interesting results, most notably that there is no significant difference in teaching reading to students with LD and those with E/BD. Two types of research recommendations were generated by the findings of the study. First, due to some of the limitations of the study, recommendations for other meta-analysis or additions to this study are made. Second, though some questions were answered by this study, many new questions were generated by the results.

Additional research. One of the major limitations of single subject research is the small sample size. This limited sample size may be one reason that no more significant effects were found. Even though when combined the sample was large, because each individual study was small, the effect sizes are somewhat inflated and differences between variables may not be noted. Another meta-analysis that included group design research may have different findings that indicate more variance between dependant variables. Also, though there are a fairly good number of studies overall, more studies on the effectiveness of peer-tutoring and self-monitoring are required to obtain more stable results.

In addition to a expanding the meta-analysis to include group design studies, other areas of research might be investigates to determine if difference exist between students with E/BD and LD. For example, the investigation might
be expanded to include the effects of math instruction on both groups, as math is often more explicitly instructed than reading. Similarly, a study examining social skill training of students with LD and E/D would be interesting to see if the interventions are equally effective with both populations. Looking at the history of research in both the fields of LD and E/BD might generate both interesting questions and interesting findings.

**New questions.** One of the new questions generated by the research grew from an interest in the behavioral outcomes of students who receive these reading interventions. In addition to the small single subject research reviewed here on academic effects, there needs to be more research on the behavioral and social effects of improving the reading level of students with E/BD. While it is clear that their reading ability improves, questions remain about whether improving their ability to read can improve their behavior, their social validity with other teachers, perhaps even their educational placement. Though some of the studies of students with E/BD provided a measure of behavior improvement, many did not and therefore, this variable could not be included in the analysis. It is possible that students who improve academically and can read on grade level would be more successful in their inclusion classes and than their counterparts who still struggle with reading.

Also, though these single subject studies contribute significantly to the field, research is needed and, is beginning to occur, on a larger scale to truly validate the best reading interventions. In the past 20 years, the field of E/BD has established an extensive knowledge base of behavioral and social supports
(Mathur, Quinn, & Rutherford, 1996). Thus, the focus on the academic and reading research needs for this population must continue. The political climate supports continuing to seek knowledge about effective reading and allows for a focus on reading research to be possible. Hopefully, the field of researchers in LD and E/BD will work together and continue to inform educators of these students.

Conclusion

Students with E/BD continue to struggle in schools both behaviorally and academically. In order to effectively address the schooling of these students, both areas of need must be dealt with. The field of E/BD has established some very effective behavioral practices but is just learning how to deal with the academic needs of these students. This study indicates that one way to effectively address their needs is to explicitly teach reading, in much the way that students with LD are taught how to read. Using known reading interventions can help students with E/BD become much more effective readers and improve their academic success.

In sum, this study had interesting results despite the fact that no effect was found. The reading interventions that have been used to teach students with learning disabilities are also effective to teach reading to students with behavioral disorders. These results have implications for both practice and future research. Teachers need to learn and teach these effective reading interventions to students with E/BD who are also struggling readers. Researchers need to continue to see which individual reading interventions are most effective, rather
than developing unique E/BD reading programs. By putting the empirically based program into classrooms for students with LD and BD, education for many struggling students can be improved.
APPENDIX A

INTERNAL REVIEW BOARD APPROVAL
April 29, 2005

Francesca Jones  
Department of Technology and Cognition  
University of North Texas  

RE: Human Subjects Application No. 05-038  

Dear Ms. Jones:  

Your proposal titled “Meta Analysis of Peer and Direct Instruction Reading Interventions for Students with LD and ED Using Hierarchical Linear Modeling” has been approved by the Institutional Review Board and is exempt from further review under 45 CFR 46.101. Federal policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only.  

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. Please mark your calendar accordingly. The IRB must also review this project prior to any modifications.  

Please contact Shelia Bourns, Compliance Administrator, ext. 3940 or Boyd Herndon, Director of Research Compliance, ext. 3941, if you wish to make such changes or need additional information.  

Sincerely,  

Scott Simpkins, Ph.D.  
Chair  
Institutional Review Board  

SS: sb
APPENDIX B

CODING PROTOCOL
<table>
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APPENDIX C

STUDIES USED IN META-ANALYSIS


REFERENCES


