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Observations of a Multi-Component Intervention for Elementary Students with Emotional Behavioral Disorder after Self-Efficacy Coaching

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Observations of a Multi-Component Intervention for Elementary Students with Emotional Behavioral Disorder after Self-Efficacy Coaching

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by

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Abstract

Students with Emotional and Behavioral Disorders (EBD) experience more negative student outcomes compared to other special education disability categories, specifically, higher dropout rates, less access to higher education and incarceration. Mathematically, 73% of students with EBD achieve below the 50th percentile on standardized tests (Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005). This study focused on the exploration of a multi-component mathematics and behavior intervention targeting student self-efficacy for productive learning behaviors in the general education mathematics classroom setting for elementary students with EBD. Participants for this study were students from two 4th grade classrooms, who have been identified with co-occurring EBD and low mathematics achievement. Each student participated in goal setting, four days weekly self-monitoring and behavior rating. Teachers used effort-ascribed feedback and met one-on-one with students for Self-Efficacy Coaching Session for 4 weeks (16 sessions). Students were assessed prior to the treatment and post treatment, measuring on-task behavior in mathematics and mathematical achievement. A concurrent single-subject multiple baseline research design was implemented to explore student outcomes related to mathematics achievement and on-task behavior during mathematics instruction. The results indicate that Self-Efficacy Coaching has potential as a promising practice to improve students' on-task behavior and increase mathematics achievement for elementary students with EBD. Recommendation for further research include implementation with an experimental design o include a control group to determine if a causal relationship between Self-Efficacy Coaching and behavior/academic gains.

Keywords: self-efficacy, emotional and behavioral disorder, mathematics, behavior, multi-component, self-monitoring, effort-ascribed feedback

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Students are often the greatest teachers, and I appreciate the students who have taught me as much as I have taught them. Student achievements are the greatest legacy for all educators.

Dedication

To educators all over the world, and to the students they dedicate their lives to serve.

Education is the most powerful weapon which you can use to change the world.

–Nelson Mandela

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Chapter I

Introduction

Poor achievement in mathematics is a national concern. The National Assessment of Educational Progress (NAEP) average performance of 4th and 8th graders in mathematics has held steady for the last ten years nationally with 40 percent of fourth-graders and 33 percent of eighth-graders meeting the threshold for proficiency (US DOE, 2018). In Arkansas, average scores for 4th and 8th grade math rank 45th among all states with a decrease of 1 point from 2015 (US DOE, 2018). Further, the decline of low-performing students means that gaps in achievement are widening. Over the past 10 years, the gap between the bottom 10% and the top 10% widened by six points. Students identified with Emotional and Behavioral Disorder (EBD) have problematic behavior and impaired social skills that lead to negative impacts on student learning and academic achievement (Trout, Nordness, Pierce, & Epstein, 2003). In fact, students with EBD are among the least successful of all students (Bradley, Dolittle, & Bartolotta, 2008; Kern, Hilt-Panahon, & Sokol, 2009). Researchers (Balfanz, Herzog & Mac Iver 2007; Geary, 2011; Lee, 2012; Siegler, Duncan, Davis-Kean, Duckworth, Claessens, Engel, Susperreguy, & Chen, 2012) agree on the long term consequences of poor mathematical competencies in education and employment. Students diagnosed with EBD experience challenges in all academic areas, but struggle the most with mathematics (Greenbaum, Dedrick, Friedman, Kutash, Brown, Lardieri, & Pugh, 1996; Jackson & Neel, 2006).

A Nation at Risk (1983) brought to public attention for the first time the impact of behavior issues on academics, individual students, schools and society as a whole. The study found disruptive student behavior to be a contributing factor for some students receiving 1/5 as much reading instruction as others. It has been over thirty years since *A Nation at Risk* was

published, and further studies indicate that classroom disciplinary issues are worse than in the past (Braden & Smith, 2006; Colavecchio & Miller, 2002; Etheridge, 2010). Research shows that disruptive behavior not only affects the student who is noncompliant with the rules, but every other student in the classroom (Canter, 2009; Marzano, 2003). Additionally, Canter & Canter (1992) and Marzano (2003) documented the harmful effects of continuous classroom disruptions over time, and additional research indicates that the disruptive behaviors are often seen as early as preschool (Hughes & Dunn, 2002). This means that children have classroom learning environments year-after-year which require increased teacher focus to address annoying, disruptive behaviors. Student on-task behavior during mathematics instruction is crucial not only for the learners identified with EBD but for every child in the classroom.

The importance of self-efficacy beliefs is receiving increasing attention in educational research, primarily in studies of academic motivation and of self-regulation (Cleary, Velardi, & Schnaidman, 2017; ; Joet, Usher & Bressoux, 2011; Pintrich & Schunk, 1990; Shea & Bidjerano, 2010.) Self-efficacy beliefs begin to form in early childhood as the child deals with a variety of experiences, tasks and situations (Pajares, 2002). High self-efficacy helps learners create feelings of serenity in approaching difficult tasks and activities; conversely, learners with low self-efficacy may believe things are tougher than they are, which can become a self-fulfilling prophecy (Pajares, 2002). The development of self-efficacy beliefs is heavily influenced by mastery experiences (Bandura, 1984), and interventions to support the development of self-efficacy have the potential to impact learning for students with Emotional Behavioral Disorder (EBD) and all learners. Self-efficacy coaching by classroom teachers has potential as a cost-effective, easy-to-implement, student-focused behavior intervention. Mathematics learning is likely to improve with increased student engagement and on-task learning behaviors during

instruction (Kitsantas, Steen & Huie, 2009; Rimm-Kauffman, Baroody, Larsen, Curby, Abry, 2015; Usher, 2009). This study explores multi-component mathematics and behavior interventions targeting student self-efficacy for on-task behavior during mathematics instruction in the general education setting for elementary students with EBD.

Background of the Problem

Students with EBD exhibit behaviors which slow academic progress and demand teachers' attention. The study by Gable, Tonelson, Sheth, Wilson, and Park (2012) revealed evidence that students with EBD are the most challenging group of the 13 categories of diagnosed disabilities. Research indicates that between 2-20% of school-age children demonstrate patterns of behavior which may indicate Emotional and Behavioral Disorders (EBD) (Walker, Ramsey & Gresham, 2004). Students with EBD exhibit behaviors which slow academic progress and demand teachers' attention. Additionally, students with EBD are more likely retained in a grade. Seventy-three percents of students with EBD perform below the 50th percentile on standardized mathematics achievement tests (Wagner, Kutash, Duchnowsko, Epstein, & Sumi, 2005). Over time, this contributes to students with EBD showing high drop-out rates, higher unemployment, greater need for mental health services, and incarcerations with approximately 70 percent estimated to be arrested at least once during their lifetime (Bullis & Yovanoff, 2006; Greenbaum, et al 1996; U.S DOE 2005; Wagner and Davis, 2006; Walker, Ramsey & Gresham, 2004: Zigmond, 2006). Poor academic outcomes for students with EBD include high levels of retention, functioning below-grade level and the highest dropout rates across all disability categories (Greenbaum et al, 1996; Wagner, et al 2005).

Descriptive research suggests that students with EBD have a number of deficits: poor conflict resolution skills; high levels of aggression and noncompliance; poor study skills; and sub-

average academic performance (Lane, Wehby, Little, & Cooley, 2005; Nelson et al., 2004; Reid et al., 2004). Students with EBD have externalizing and internalizing behavior patterns that, by definition, impede social, behavioral, and academic progress and create challenges for society as a whole. In the school environment, their lack of decorum and limited social skills often demand teachers' attention, interfere with instruction, lead to impaired social relationships, which negatively influence the educational experiences of all students in the classroom (Lane, 2007, p. 135).

Behavior and academic deficits are highly related and interactive for students with EBD (Lane & Beebe-Frankenberger, 2004; Reid, Gonzalez, Nordness, Trout & Epstein, 2004). The relationship between behavior and academics is not surprising given that the identification for this disability category specifies criteria which demonstrate adverse effects on academic performance (IDEIA 2004; Reid, et al., 2004). Compounding this, the academic performance of students with EBD suggests that their performance may remain, at best, stable over time in reading and writing, but decline in mathematics (Anderson, Kutash, & Duchnowski, 2001; Lane, Barton-Arwood, Nelson & Wehby, 2008; Nelson, Benner, Lane & Smith, 2004). Ninety-seven percent of students with EBD ages 12-14 perform below grade level in mathematics (Bradley, Doolittle & Bartolotta, 2008; Greenbaum, et al., 1996). Forty-three percent of students with EBD score in the bottom 25th percentile and 73% score below the 50th percentile on the Woodcock-Johnson III Tests of Achievement – Mathematics Calculation subtest of achievement tests (Woodcock, McGrew & Mather, 2001). Further, Lane, Wehby, Little & Cooley (2005) found that students with EBD showed a decline over time, from an average of 22nd percentile for elementary students to 13th percentile for secondary students. This is further documented in the study by Wagner, et al (2006) which documents the drop in students' mathematical computations

from 38th percentile in elementary school to 28th percentile in high school. Additionally, students with EBD who receive mathematics instruction in pull-out settings experience instructional practices inconsistent with standards-based recommendations for high-quality mathematics instruction.

Individual Education Plan services for EBD students increasingly plan for more general-education settings, and general educators typically use school-wide Positive Behavior Support (PBS) (Bradshaw, Reinke, Brown, Bevans & Leaf, 2008; Horner, et al, 2009) as a behavior management systems for students. Targeted interventions are important for students diagnosed with EBD and at risk for EBD at all ages, and they are particularly important at the early elementary level. Reading interventions conducted with students at risk for EBD found that in addition to improved reading skills, students demonstrated decreased disruptive behavior and improved academic engagement (Harris, Oakes, Lane & Rutherford, 2009; Lane & Menzies, 2003; Lane, O'Shaughnessy, Lambros, Gresham & Beebe-Frankenberger, 2001; Nelson, Martella & Marchand-Martella, 2002). In terms of students with behavioral challenges, Positive Behavior Support (PBS) models provide graduated support for addressing disruptive behaviors as warranted in an effort to (a) prevent the development of behavioral problems that may lead to EBD and (b) support students with EBD by implementing targeted interventions at the secondary and tertiary levels (Lane, 2007). Carefully designed PBS programs are able to address the full range of learning and behavioral needs in a scientific, feasible manner (Lane, 2007, p. 139). Studies of reading interventions document positive outcomes in interventions that target both behavior and academics at the elementary level (Lane et al., 2001; Lane & Wehby, 2002).

Underlying achievement in both behavior and academics are the self-efficacy beliefs which a child has developed through their experiences in the world (Bandura, 1984). Self-efficacy beliefs

themselves operate in concert with other socio-cognitive factors, such as outcome expectations or goals, in the regulation of human behavior. But Bandura (1984) has argued that, because individuals' beliefs of personal competence touch, at least to some extent, most everything they do and because self-efficacy beliefs mediate to a great extent the effect of other determinants of behavior, when these determinants are controlled, self-efficacy judgments should prove excellent predictors of choice and direction of behavior.

Definition of Terms

In this section, terms which are important to this study are defined and operationalized:

Effort-ascribed feedback is another name for attributional feedback based on the belief that increased effort will produce success (Dweck, 1975; Weiner, 1979;). For the purposes of this study effort attributional feedback is given in the context of competency development on children's percepts of self-efficacy and achievement (Schunk, 1982).

Self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives, including influencing expected outcomes (Bandura, 1997). Self-efficacy is a context-specific construct, and it requires a context-specific assessment of both the construct and outcomes. For the purposes of this study, self-efficacy is operationally defined as student's beliefs related to learning mathematics. Self-efficacy coaching is operationally defined as teachers/mentors engaging students in purposeful activities to facilitate the development of student self-efficacy for mathematics, including self-reflection and goal setting, daily mentor/coaching meetings and tracking behavior data to compare the child's outcomes with their own personal goals.

Self-monitoring is defined as the practice of observing and recording one's own academic and social behaviors (Hallahan & Kauffman, 2000). For the purposes of this study, self-monitoring will be operationally defined as student's self-observing their on-task and academic behaviors during mathematics instruction. The self-monitoring will be focused on academic behaviors which support learning during mathematics instruction: a) attending to assigned activity, b) appropriate motor responses, c) staying in assigned area and d) verbal participation.

Mathematics achievement will be operationally defined as the scores obtained by students on the classroom Common Formative Assessments and Common Summative Assessments given to determine mastery of the Learning Targets for five mathematics Units throughout the year.

Purpose and Significance of the Study

Bandura (1997) has cautioned researchers attempting to predict academic outcomes from students' self-efficacy beliefs that, to increase accuracy of prediction, self-efficacy beliefs should be measured in terms of particularized judgments of capability that may vary across realms of activity, different levels of task demands within a given activity domain, and under different situational circumstances (p. 6). Additionally, efficacy beliefs should be assessed at the optimal level of specificity that corresponds to the criterial task being assessed and the domain of functioning being analyzed (Bandura, 1997). With the exception of a couple of studies, (Schunk, 1982; Schunk & Hanson, 1985) exploration of the influence of attributional feedback, modeling effects, and goal setting on self-efficacy beliefs, little is known about how vicarious experiences and verbal persuasions affect the creation and development of academic self-efficacy beliefs. The purpose of this study is to investigate multi-component mathematics and behavior

interventions targeting student self-efficacy for on-task behavior in general education mathematics instruction for elementary students with EBD**.**

Research questions.

The research questions that guide this research are as follows:

Research question 1: self-efficacy and behavior interventions

Are there significant differences in the measured improvement of targeted students' on-task behaviors of children with disruptive behaviors after Self-Efficacy coaching?

Research question 2: self-efficacy and student mathematics achievement

Are there significant differences in the measured improvement of targeted students' mathematics achievement of children with disruptive behaviors after Self-Efficacy coaching?

Chapter II

Review of the Literature

This chapter provides a comprehensive, yet not exhaustive review of the literature related to multi-component mathematics and behavior interventions targeting student self-efficacy for on-task behavior. This study focuses on the general-education setting for mathematics instruction for elementary students with Emotional Behavioral Disorder (EBD). Self-efficacy is important for children with EBD due to the relationship among self-efficacy, self-fulfilling prophecy and academic achievement. Children with EBD commonly experience co-existing academic gaps, and they typically increase over time (Landrum, Tankersley, & Kauffman, 2003; Lee, 2012;). Poor academic achievement by students with EBD is exhibited across core subject areas, but students with EBD seem to struggle the most with mathematics (Geary, 2004; Greenbaum et al, 1996; Jackson & Neel, 2006; Wagner, et al, 2005). Mathematics is often a gatekeeper for students keeping them from attending college, graduating high school or participating in grade-level mathematics instruction along with their peers (Geary, 2004; Jackson & Neel, 2006; Shapka, Domene, & Keating, 2006). Students with EBD internalize and externalize behaviors which disrupt learning, slow academic progress and demand teachers' attention (Bradley, Dolittle, & Bartolotta, 2008). Self-efficacy for learning provides children with resilience, problem solving and self-regulation skills, all of which are important for success in school and beyond (Bandura, 1977; Bernacki, Nokes-Malach, & Aleven, 2015; Eklund, Loeb, Hansen, & Andersson-Wallin, 2012).

Success in School

The importance of success in school goes beyond grades or admission to college. Many students who perform poorly in school demonstrate such problem behaviors as aggression,

property destruction, poor peer relations, and frequent negative interactions with the teacher (Reid, Gonzalez, Nordness, Trout, & Epstein, 2004; Wehby, Symons, & Shores, 1995). These problems present as early as preschool when children show poor executive function skills (Hughes & Dunn, 2002). We think of preschoolers with problem behaviors as being at-risk, and those children are often targeted for interventions. However, traditional activities and games help children build executive function skills: Simon Says, Musical Statues, and Grandma's Footsteps build motor inhibition skills; the card game Pairs builds working memory; identifying photographs of items taken from unusual angles builds cognitive flexibility; and learning to cope with changes of rules builds another type of flexibility (Tominey, 2011).

Greenbaum, et al (1996) and Wagner, et al (2005) report that students with Emotional Behavioral Disorder (EBD) perform below grade level in mathematics, and almost half of the time, score in the bottom 25th percentile of standardized mathematics assessments, and 75% perform below the 50th percentile on standardized mathematics achievement tests (Wagner, Kutash, Duchnowsko, Epstein, & Sumi, 2005). In addition, students with EBD experience negative educational outcomes more than their non-disabled peers: they are more likely to be retained in a grade (Greenbaum et al, 1996; Wagner, et al 2005), and they experience longer-term negative outcomes, including high drop-out rates (Greenbaum et al, 1996).

Descriptive research suggests that students with EBD have a number of deficits which impact success in school: poor conflict resolution skills; high levels of aggression and noncompliance; poor study skills; and sub-average academic performance (Lane, Wehby, Little, & Cooley, 2005; Nelson et al., 2004; Reid et al., 2004). These behavior patterns, by definition, impede social, behavioral, and academic progress and create challenges for society as a whole. In the school environment, students with EBD lack of decorum and poor social skills often

monopolize teachers' attention, interfere with instruction, impair social relationships, and negatively influence the educational experiences of all students in the classroom (Lane, 2007, p. 135).

School readiness behaviors are more than simply academic skills (Morris, 2015). School readiness is best addressed through an executive function lens and a wide range of activities rather than by solely focusing on academic skills (Morris, 2015). Executive functions have gained widespread interest among mental health professionals, parents and clinicians for the treatment of disruptive behaviors, including self-regulation, organizational skills, goal setting, problem solving and decision making skills (Barkley, 2014). Effort, persistence and resilience are crucial factors for student achievement of behavior which supports learning since achievement of those goals leads to the development of executive functions which play key roles in school readiness for students: planning, self-regulation, organizational skills, goal setting, problem solving and judgement (Lezak, 1993). Lacking these school-readiness skills impacts learning in all areas, and can lead to academic deficiencies which may be incorrectly identified as learning disabilities in students with disruptive behaviors (Khanehkeshi & Ahmedi, 2013.)

Executive functions are important to meta-cognition, and meta-cognition is related to self-efficacy in children (Toglia & Kirk, 2000). Children use cognitions and meta-cognitions to maintain self-belief structures through meta-cognitive processes (Toglia & Kirk, 2000). It is hypothesized that environmental triggers assist in creating the development of schemas which in turn contribute to the development of the level of self-efficacy an individual will have (Toglia & Kirk, 2000). The experiences an individual has will be interpreted and processed in relation to their schema. By impacting processing patterns at the meta-cognitive levels, dissonance can be created between existing beliefs and processing which may results in changes to self-efficacy

levels (Toglia & Kirk, 2000). Success in school is connected to an individual's self-efficacy. A child must first believe that they can be successful, and as a result, they will be more likely to make a concerted, extended efforts (Schunk & Pajares, 2002).

The factors which influence behavior are rooted in the core belief that one has the capability to accomplish that behavior (Pajares, 2002). The development of self-efficacy beliefs normally continues throughout life as people learn, experience and develop into more complex human beings. When self-efficacy beliefs form, information is used from various sources, including social interactions and master experiences. This may be problematic for students with EBD due to academic experiences which may not provide positive social interactions or master experiences from which the students can draw.

Morris (2015) describes the normal development process, behavior and executive function skills for children, and how the relationship with primary caregivers provides for children what they need to meet their three psychological needs: relatedness, autonomy and competence. Positive behavior is promoted by providing environments that enable children to meet their psychological needs, and as they grow children internalize the behavioral expectations of their communities.

Special education. Success in school for many children is related to support services. Special education services are intended to support learning for students with disabilities so they can learn in spite of disabilities and achieve success in school. From 1976-77 through 2013-14, the number of children aged 3-21 who were served under the IDEA saw a 75% increase. The 3,694,000 students who were served in 1976-77 were 8.3% of all children enrolled in public schools. By 2103-14, the 6,464,000 students who were served were 13.8% of all children enrolled. During that same time, students with Emotional Behavioral Disorders (EBD) also

increased, from 283,000 to 354,000, which is a 25% increase from 1976-77 to 2014-15. Students with EBD peaked at the highest numbers in 2003-04 and 2004-05, with 489,000 children being served under IDEA in that category, which is a 73% increase from 1976-77. It is important to note that during the time period from 1976-77 until 2000-01, there were no students served under IDEA within the category of autism or developmental delay. Beginning in 2000-01, those two categories saw a remarkable growth over the next 13 years: 538,000 students with autism in 2013-14 and 410,000 students with developmental delays, which is a 478% and 92% increase, respectively (U. S. Department of Education, 2016).

Changes in classification systems are contributing to growth in some categories. Some children with disabilities are being reclassified; for example, a child who might once have been identified as intellectually disabled or emotionally disturbed might now be classified as autistic. (U.S. Department of Education, 2016). The change in children identified with EBD is impacted by changes in identification criteria and thresholds to qualify for services under IDEA. Some children who may not have met a state's guidelines for identification for special education services in prior years, may now meet that standard. In addition, policy changes such as the rise of response to intervention (RTI), an educational framework designed to provide targeted assistance to academically and behaviorally struggling students. The national emphasis on RTI is due to the 2004 reauthorization of the IDEA which gave the RTI method a strong boost (United States Department of Education, 2016).

The passage in 1975 of the Education for All Handicapped Children Act (since 1990, the Individuals with Disabilities Education Act (IDEA)), guaranteed all children and youth with disabilities access to their local public schools as a civil right. By 2006, six million public school students received special education services under the IDEA, approximately 13 percent of all

students, and these figures signal the increased access to public schooling for children with special educational needs as well as elaborated classification systems that facilitate growth in the proportion of students labeled and thus receiving services (Richardson & Powell, 2011, np).

However, society's meaning for "educating all children" has changed over the last 40 years. For nations that enacted compulsory education comparatively early, principally Western nations, the "special class" and the "special school" emerged to meet calls for compulsory education for all children by providing schools and teachers with service options and targeted resources (Richardson & Powell, 2011, np). Thus, the organization of special education began not with broad participation, but rather as an additional means of restriction and (re)segregation (Richardson & Powell, 2011, np). What started out as separate, however, has now become more inclusive. Defining success in school for students with disabilities is problematic due to the conflicting values of (1) integration through participation and (2) individual aptitude and achievement, which is continuously measured by standardized tests. This creates tensions and debates among educators who either focus on students' individual learning goals or meeting collective standards (Richardson & Powell, 2011, np). Consequently, more demands by parents of special needs students and students' rights advocates for increased time in the general education setting. In the United States in 2005, more than half of all special education students spent almost the whole school day in general classrooms (inclusion), a quarter spent a majority of the day in regular education (integration), 17 percent were schooled mainly in special classrooms (separation), and only 4 percent attended separate facilities (segregation) (U. S. Department of Education, 2016). This places the responsibility for special education students' success in school on both general education and special education staff.

Ironically, as students matriculate through the grade levels of school, they become at greater risk of being labeled disabled (Richardson & Powell, 2011, np). Formal schooling shapes the life courses not only of the highly educated, as educational expectations have risen considerably, but also of all young adults. Attitudinal and environmental barriers provide important explanations for the rise of special education and its impact on children's success in school (Richardson & Powell, 2011, np).

Success in society. Students with Emotional Behavioral Disorder (EBD) experience long-term negative outcomes even after leaving school with consequences for the individuals and also society as a whole. Negative outcomes include higher unemployment, greater need for mental health services, and more incarcerations than their peers (Bullis & Yovanoff, 2006; Greenbaum, et al, 1996; U.S DOE 2005; Wagner and Davis, 2006; Walker, Ramsey & Gresham, 2004: Zigmond, 2006). Further, students with EBD show high drop-out rates, higher unemployment than their peers, greater need for mental health services, and proportionally more incarcerations with approximately 70 percent estimated to be arrested at least once during their lifetime (Bullis & Yovanoff, 2006; Greenbaum, et al 1996; U.S DOE 2005; Wagner & Davis, 2006; Walker, Ramsey & Gresham, 2004: Zigmond, 2006).

The success of students with EBD impacts society through increased costs for unemployment, health and mental health services and high costs associated with incarceration. Additionally, society as a whole loses the collective impact when all individual members are unable to reach their full potential and contribute their talents and unique viewpoints to their communities. More than ever before, being disabled remains linked to being less educated than one's peers (Richardson & Powell, 2011, np), and being less educated leads to an increased risk of becoming disabled, of experiencing poverty, and of suffering social exclusion (Richardson &

Powell, 2011, np). As they grow, children internalize the behavioral expectations of their communities. The way in which this internalization takes place has long-term consequences for their behavior and well-being (Morris, 2015). With so much at stake educationally and in society as a whole, we as educators need tools to attain better educational outcomes for our most at-risk learners. Emotional Behavioral Disorder are certainly in that group.

Teachers Lack of Training

Wehby & Kern (2014) concluded, when we reflect on the last 35 years of educational research, as well as conversations with educators across the country, we can identify two relatively stable conclusions:

- Students with significant behavioral difficulties, including those with emotional behavioral disorder (EBD), have among the poorest social and academic outcomes of any group of students.
- Teachers and other school personnel feel inadequately prepared to work with these students.

It is difficult for teachers to rise above the educational systems which have created them. Individual educational trajectories result from school-specific opportunity structures and decision making which relies heavily on institutionalized characteristics of education systems. These characteristics include teachers' values and beliefs, past training, personal and practical experiences with diverse student bodies and special educational needs, and the resources and support made available to teachers. These characteristics influence how teachers will react to students' diverse range of abilities and other characteristics, including disruptive behavior (Richardson & Powell, 2011, np).

School-wide problem-solving systems provide support and resources for teachers, but additional tools are needed which classroom teachers can use on the frontlines to improve the effectiveness of classroom behavior interventions. Tools are needed to decrease the interruption of instruction due to disruptive behaviors, to improve the time on task for students, and to improve the overall effectiveness of classroom instruction (Boynton & Boynton, 2005). Self-regulation related to learning and managing peer relations has been shown as important for changing and managing disruptive behavior (Locke & Latham, 2002), but many classroom teachers have few resources and little training for recognizing skill deficits and planning behavior supports for students.

Despite the research behind Positive Behavior Support (PBS) and other evidence-based practices, overall teachers feel unprepared to teach students with Emotional Behavioral Disorder (EBD) the social and behavioral skill necessary for their appropriate academic development (Gable, et al., 2012). Since some of the instruction received by students with EBD occurs in general education classrooms and is expounded upon by their special education classroom teachers, Gable et al. (2012) wanted to determine what effect these teachers have on the success of students with EBD. In theory, better prepared teachers who see the importance of incorporating evidence-based strategies and put them into practice, should result in students with EBD becoming more successful. Gable, Tonelson, Sheth, Wilson, & Park (2012) tested this hypothesis, and over 80% of both general education and special education teachers basically agreed on the importance of most evidence-based practices. Despite this, the results also showed that less than 40% of them put the evidence-based strategies into use. Lack of teacher preparedness in these areas directly impacts the future success of students with EBD, in school and in society. The findings of this study were also substantiated in previous investigations

(Wagner, Friend, Bursack, Kutash, Duchnowski, Sumi, & Epstein, 2006) which suggest that most students with EBD do not receive an education based on empirically-supported practices in the special education classrooms (Landrum, Tankersley, & Kauffman, 2003; Simpson, Peterson, & Smith, 2011). As a result, we see increased teacher burnout and increased student failure rates (Gable, et al. 2012). Researchers emphasize the need to provide educators and staff with adequate preparation and support to empower students with EBD to reach academic, social, and behavioral potentials (Gable et al, 2012; Landrum et al., 2003; Simpson, Peterson, & Smith, 2011).

The school context where students with EBD receive services remain problematic due to issues with these issues with teacher preparedness, student programming and instruction. Teachers and administrators report that students with EBD create some of the most challenging situations to handle, which results in less instructional engagement and high rates of disruptive behavior (Braden & Smith, 2006; Colavecchio & Miller, 2002; Etheridge, 2010). The problematic behavior impacts both special educators and general educators throughout the school day. Many students with EBD spend a greater proportion of their day in a specialized setting than their otherwise disabled peers (Wehby, Symons & Shores, 1995).

Despite spending more time in the specialized setting, Wehby, Symons & Shores, (1995) reports that the special education instructional and classroom management programs which serve students with EBD are limited in meeting the academic, social and behavioral needs of the students served. These classrooms and the academic practices often serve students with EBD using workbooks and worksheets, provide limited access to high-quality instructional techniques, lack adaptations to curriculum and attention to students' academic needs (Davis, et al., 2003; Jackson & Neel, 2006; Nelson, 1996; Shores, & Wehby, 1993; Wehby, Symons &

Shores, 1995). This is despite the fact that students with EBD have been observed to demonstrate a lack of engagement with academics, and "pervasive boredom and apathy" towards learning (Nelson, 1996, p. 146-147). Factors like these result in more demands by parents of special needs students and students' rights advocates for increased time in the general education setting.

The achievement gap is further complicated by deeply-held, and often opposing, philosophical differences between mathematics educators and special educators (Baroody, 2011; Maccini & Gagnon, 2002; Woodward & Montague, 2002). Disagreements between these two communities of educators center on instructional emphasis on specific mathematical knowledge and skills, disagreement on pedagogy, and philosophical debates on individual learning deficits (Woodward & Montague, 2002). At the root of the disagreements is how children learn, with competing theories from behaviorism, cognitive psychology and constructivism (Woodward, 2001). Special education's primary focus on student needs or deficits further complicates things. For Special Educators, adaptations are individualized, based upon student strength and needs, and relevant to the objectives taught and designed so that learning can occur (Bryant, Kim, Hartman & Bryant 2006). Conversely, mathematics educators assert that instruction which is adapted based upon individual deficits places that deficit within the individual, operates within a deficit model, and further exacerbates the belief that not all students are capable of learning (Cleary, Velardi, & Schnaidman, 2017). Although mathematics educators recognize that some students do have Mathematics Learning Disabilities (MLD), it is viewed as problematic when students who are victims of ineffective or inappropriate instruction are improperly identified as MLD (Baroody, 2011). Math educators feel that these improper identifications further reinforce students' perception of their own inadequate mathematical ability (Cleary, et al, 2017) becoming a self-fulfilling prophecy.

Additionally, special educators' tend to focus on basic skills, regardless of grade-level standards, thus limiting students access to general education curriculum as required by IDEA (Maccini & Gagnon, 2002). For mathematics educators, providing special education students access to general education mathematics curricula means following the *Principles to Actions: Ensuring Mathematical Success for All* (NCTM, 2014) and Common Core standards (CCSSI, 2010), which emphasize problem-solving, mathematical reasoning and communication of mathematical thinking. Standards-based mathematics instruction go beyond basic skills; rather, students are engaged in making conjectures, justifying and questioning each other's ideas and developing deep levels of mathematical understanding (Martino & Maher, 1999; Yackel, 2002). Instructional models such as Cognitively Guided Instruction (CGI) and Extending Children Mathematically (ECM) align with NCTM and CCSSI standards, in that they prepare students by building mathematical dispositions which are underpinned by deep conceptual knowledge of our number system. In contrast, special educators rely on much less rigorous curriculum, namely computation (Jackson & Neel, 2006; Maccini & Gagnon, 2002; Montague & Jitendra, 2006). Students with EBD who receive mathematics instruction in pull-out settings experience instructional practices inconsistent with standards-based recommendations for high-quality mathematics instruction. Lane, et al. (2002) found that students with EBD showed an academic decline in mathematics over time, from an average of the 22nd percentile for elementary students to the 13th percentile for secondary students. This is further documented by Wagner, et al. (2006) who documented students' mathematical computation achievement dropping from the 38th percentile in elementary to the 28th percentile in high school.

Mathematical instruction in the early grades should be built around foundational knowledge of key computational principles (Jordan, et al., 2003). Student fluency of

mathematical operations is necessary for mathematics achievement at all grade levels, and research suggests these deficits in calculation skills can be traced to gaps in student understanding of the meaning of numbers and number operations, also known as number sense (Gersten, Jordan & Flojo, 2005; Malofeeva, et al., 2004). In addition, the context for mathematics instruction today includes a focus on the Common Core Standards for Mathematical Practice (CCSSI, 2010):

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

These standards describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years (CCSSI, 2010, p. 8).

Considering the lack of access students with EBD have to standards-based mathematics instruction in the elementary grades, student struggles with math are not surprising. Over the years, weak number sense subsequently results in poorly developed counting procedures, slow retrieval of basic facts, and inaccurate computation skills, which are all characteristics of mathematics learning disabilities (Geary, et al., 2000; Jordan, et al., 2003). Basic number sense

has been considered a cognitive function and, somewhat independent of general memory, language and spatial knowledge (Gelman & Butterworth, 2005; Landerl, et al., 2004). The rate of co-occurrence between reading and mathematics difficulties is high, but specific difficulties in mathematics with normal development in other cognitive and academic areas are also documented (; Butterworth & Reigosa, 2007; Jordan, Logel, Spencer, Zanna, & Whitfield, 2009).

Elementary mathematics. Lee (2012) named math as one of the more important factors influencing college readiness. Math achievement also explains about 30% to 60% of variance in the chance of students' being on track to college readiness (Lee, 2012). State-mandated math assessments associated with the No Child Left Behind (NCLB) Act of 2001 typically begin in third grade, and NCLB added new mandates [on special education] including equal access to the general curriculum and the requirements for students with disabilities to pass standardized assessments before advancing to the next grade level…thereby aligning the Individual Education Plan (IEP) performance goals and indicators for students with disabilities with those set for students without disabilities (Cosier & Ashby, 2016, p. 84). Students with an IEP are identified by their disability yet are expected to meet the same academic standards as their non-disabled peers.

In practically every school district in all 50 states, children are screened for potential reading difficulties in the primary grades (Gersten & Jordan, 2005). Reading screenings and the results have been important for identifying those who will need additional instructional support as well as for monitoring progress. Moreover, effective reading screenings have led to the development of evidence-based interventions, such as interventions targeting phonological awareness in reading (Bus & van IJzendoorn, 1999). In mathematics, on the other hand, research

on screenings for potential math difficulties is still in its infancy (Gersten, et al., 2005). As a result, children with math difficulties are likely to be underserved in early elementary school, resulting in poor mathematics achievement by 3rd and 4th grade. Assessment results show that students who matriculate through school with weak math skills by the end of middle school, are less likely to graduate from college than students who are strong in mathematics (National Mathematics Advisory Panel, 2007). Furthermore, though poor academic achievement by students with Emotional Behavioral Disorders (EBD) is exhibited across core subject areas, students with EBD seem to struggle the most with mathematics. Greenbaum, et al., (1996) reported that 97% of students with EBD ages 12-14 were reported as performing below grade level in mathematics, and more recently, Wagner, et al,. (2005) reported low achievement rates with 43% of students with EBD scoring in the bottom 25th percentile of standardized mathematics assessments.

While targeted interventions are important for students with and at risk for EBD at all ages, they are particularly important at the early elementary level. Some reading interventions conducted with students at risk for EBD found that in addition to improved reading skills, students demonstrated decreased disruptive behavior and improved academic engagement (Lane et al., 2001; Lane & Wehby., 2002). According to Wehby, Falk, Barton-Arwood, Lane, and Cooley (2003), historically, documentation has shown children with Emotional Behavior Disorder (EBD) have difficulties with reading. Students with reading disabilities are more likely to be referred to restrictive settings for serious emotional disturbance than are students displaying other types of academic deficits (McGinnis & Forness, 1988). Most students who have not developed adequate reading skills by the end of the first or second year of school continue to remain poor readers throughout their later school years. Poor reading skills of students with EBD

further hinder their already challenged academic progress and inhibit social skills necessary for a successful school experience. Low self-esteem, disruptive behaviors, school failures and dropouts are more prevalent in this population of students than with students of other disability groups (Rylance, 1997). The focus on reading is appropriate and necessary. However, additional research and identification of mathematics universal screeners and progress monitoring tools are urgently needed to compliment the programming we have in reading.

Attempts to Address the Problem

Attempts to address disruptive behavior and poor mathematics achievement outcomes for students with Emotional Behavioral Disorder have been varied and some report positive results in some areas, but also limited success in other areas. The research and teaching communities have shifted the focus towards the school as an agent of change with the use of three-tiered models of Positive Behavior Support (PBS) in an effort to meet the multiple needs of students with and at risk for learning and behavior problems (Bradshaw, et al., 2008; Horner, Sugai, Smolkowski, Todd, Nakasota, & Esperanza, 2009; Lewis & Sugai, 1999). Schoolwide systems of support for behavior include proactive strategies for defining expectations, teaching students and adults consistent procedures throughout the campus, both classroom and non-classroom areas such as restroom, hallways, and playground (Scheuerman & Hall, 2012). Schoolwide PBS moves away from past punitive practices with a discipline focus on reacting to specific student misbehavior by implementing punishment-based strategies, including reprimands, loss of privileges, office referrals, suspensions, and expulsions (MTSS (ND). Instead the purpose of school-wide PBS is establish a climate in which appropriate behavior is the norm, instead of waiting for misbehavior to occur before responding.

Research has demonstrated the effectiveness of positive behavior supports in addressing the challenges of behaviors that are dangerous, highly disruptive, and/or impede learning (Colvin, 2004; Jenson, Rhode, Evans & Morgan, 2013; Johns & Carr, 2012). Lane (2007) recommended that inquiry be conducted within existing PBS models to document baseline and comparison conditions (p. 152). The research and teaching communities have shifted the focus towards the school as an agent of change with the use of three-tiered models of positive behavior support (PBS) in an effort to meet the multiple needs of students with and at risk for learning and behavior problems (PBS; Horner, et al., 2009; Lewis & Sugai, 1999).

Response to intervention. The reauthorization of the Individuals with Disabilities Act of 2004 (IDEA) introduced Response to Intervention (RTI) as a tiered approach to problem solving which schools use as the process to address both academics and behavior challenges of students in order to address the issue of over-identification of learning disabilities (IDEA, 2004). Although the model addresses both academic and behavior, my focus solely be on the behavior aspect. Since 2004, public schools are required to implement RtI to ensure that research-based practices are being implemented with fidelity by school staff on behalf of struggling students, including those with disruptive behaviors. Punitive punishments which have been used include removal from the classroom, through suspension or expulsion, and it is not a supported practice. In addition, it may become a violation of a child's rights to a free and appropriate public education (IDEA, 2004). In contrast, RTI provides a structured problem-solving process, which includes disruptive behavior 1) Problem Identification, 2) Problem Analysis, 3) Intervention Design, and 4) Response to Intervention Evaluation using data analysis (MTSS, nd). See Fig. 1 below.

Figure 1. *RtI Problem Solving Cycle*

Arkansas has adopted this four-step model as a research-based best practice for addressing student behaviors in a solution oriented way.

> *First, identify the problem behaviors of all students, groups of students or individuals. Next, understand why those behaviors problems are occurring, which is Problem Analysis. Based upon this understanding of why behavior is occurring, school personnel and teams can develop effective and efficient interventions to address the problem behavior and then progress monitor whether students are responding to the interventions (MTSS, ND, p. 3).*

Effectiveness of interventions is paramount to the system, and pivotal to the achievement of student behavior goals. Intervention typically includes instructing students in social skills and implementing resources such as social stories (MTSS, ND). The goal is to ensure the smooth running of classrooms, maximize instructional time and decrease loss of instructional time due to disruptive behavior. Additional targeted instruction is also matched to student needs, student progress is monitored frequently for changes, and student data are gathered and reviewed to make important educational decisions (NASDSE, 2007).

RtI is a three-tiered system, and students move from Tier to Tier for a variety of reasons when they do not respond to interventions. Tier I behavior support which is provided to all students, such as Positive Behavior Support (Bradshaw at al, 2008; Horner at al, 2009). Tier II interventions are more frequent and intense than Tier I, based on the child's specific needs, and

monitored by ratings of the classroom teacher on a school-wide Behavior Rating form. If a child does not respond to Tier II interventions, they move Tier III. These interventions are more frequent, more intense, and specifically designed to target an individual child's most extreme behaviors (Table 1).

Table 1
Response to Intervention: Three Tiers

Tier	Who participates?	Primary Goal	Intensity
Tier I	All settings/All students	Preventive	Proactive
Tier II	Some students (at risk)	High-efficiency	Rapid Response
Tier III	Individual students	Assessment-based	Intense, durable procedures

Figure 2 (below) is a typical example of how schools use the RTI framework for problem solving and decision making as part of a PBIS system (Stuckey-Smith & Wogan, nd). In addition to problem solving, Response to Intervention (RTI) data is important as a source of predictive statistics which are needed for accurate screening if a child is being considered for special education services (IDEA, 2004).

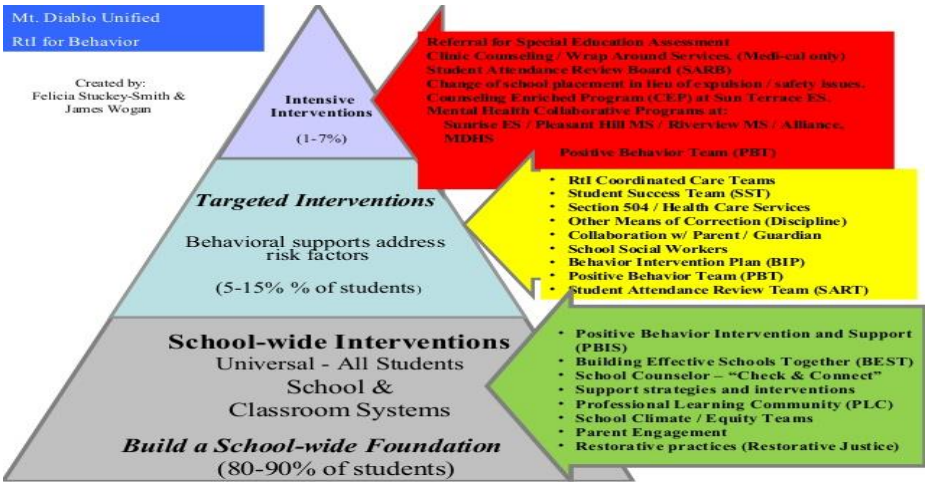

*Figure 2***.** RtI behavior pyramid of interventions.

In *Response to Intervention for Behavior (RTI:B): A Technical Assistance Paper* (2008), a three-tiered model for instruction and intervention is delineated:

Tier I: Behavioral supports are provided at a core or universal level which is intended for all students in a school, but typically meets only 80%-90% of students' needs.

Tier II: Around 5-15% of students with identified needs also receive supplemental or targeted instruction and intervention.

Tier III: A few students, around 1-7%, with the most severe needs, receive intensive and individualized behavioral support (MTSS, nd).

Examples of one school's menu of interventions for each Tier are listed in the green, yellow and red arrows on the right of Fig. 2 above.

Tier I provides preventative and proactive strategies and supports. Schools use building-wide, preventive and proactive supports to structure the learning environment and make expectations clear for all students (MTSS, nd):

- Positive Behavior Support (PBS).
- Direct instruction of expectations, routines and procedures for all common areas of a school.
- Queue or prompt transitions between tasks (Otten & Tuttle, 2011).
- Use different work areas (Scheuermann & Hall, 2012).
- Follow up with the student to ensure understanding of the task (Kerr & Nelson, 2010).
- Establish predictable procedures and routines, and ensure that they are followed (Kern & Clemens, 2007; Otten & Tuttle, 2011; Scheuermann & Hall, 2012).
- Designate a quiet time or cool down area in each classroom (Colvin, 2004).

Tier II provides additional instruction and interventions (MTSS, nd). Tier II supports are more intensive, and students are served in small groups with targeted interventions to teach students new skills as a replacement for problem behaviors. Interventions are tailored to address each individual's needs (Scheuermann & Hall, 2012):

- Classroom behavior plans and behavior checklists (Scheuermann & Hall, 2012).
- Use direct instruction to teach new skills and concepts to students (Scheuermann & Hall, 2012).
- Incorporate student interests into the lesson (Otten & Tuttle, 2011).
- Allow the student to read or hear a social story or social narrative regarding expected behavior (Crozier & Tincani, 2007; Gray, 2000; Otten & Tuttle, 2011; Hawken, Adolphson, Macleod & Schumann, 2009; Rhode, Jenson & Reavis, 1994).
- Establish a relationship with the student (Mendler & Mendler, 2012; Mendler, 2000; Otten & Tuttle, 2011).
- Assign a mentor to address behavioral skills deficits
- Use video modeling to teach behavioral skills (Kerr & Nelson, 2010; Otten & Tuttle, 2011).
- Check-in/Check-Out (CICO) (Hawken, Adolphson, Macleod & Schumann, 2009).

Tier III is designed to focus on the needs of students who exhibit patterns of severe or extreme problem behavior. Research has demonstrated the effectiveness of positive behavior supports in addressing the challenges of behaviors that are dangerous, highly disruptive, and/or impede learning (Colvin, 2004; Jenson, Rhode, Evans & Morgan, 2013; MTSS, nd; Johns & Carr, 2012). Tier III typically involves a Functional Behavior Assessment (FBA) to investigate why a behavior is occurring and help guide the development of a behavior intervention plan

(BIP). A BIP includes research-based interventions, detailed progress monitoring expectations, and additional staff time and resources dedicated to problem solving for individual students (MTSS, nd). Students are identified for Tier III supports when data document a poor response to Tier II interventions. In addition, some crisis situations and problems with high severity may require that students receive more intensive supports at Tier III even if they have not had adequate previous exposure Tier I and Tier II interventions and supports (MTSS, ND, p. 23):

- Planned ignoring with social acknowledgement (Colvin, 2010).
- Break from non-preferred academic activities (Otten & Tuttle, 2011).
- Teacher-led private behavior conference (Colvin, 2009).
- Mental health services (Jenson, Rhode, Morgan & Evans, 2013).
- Change of school placement (Jenson et al., 2013).

  Referral for Special Education assessment (Johns & Carr, 2012).

Research has demonstrated the effectiveness of positive behavior supports in addressing the challenges of behaviors that are dangerous, highly disruptive, and/or impede learning (Colvin, 2004; Jenson et al., 2013; Johns & Carr, 2012). However, RTI provides limited resources for teachers targeting students with Emotional Behavioral Disorder. In addition, RTI data are a required component of data collection required for special education testing, and guidance on best-practices for data collection are not EBD-specific. Tier III typically involves a Functional Behavior Assessment (FBA) to investigate why a behavior is occurring and develop a behavior intervention plan (BIP) including research-based interventions, detailed progress monitoring, and typically, additional staff time and resources dedicated to problem solving for individual students (FPBSP 2008). Studies focusing on behavior as the targeted skill resulted in improved social and/or behavioral outcomes Table 2 below (Alber, Anderson, Martin & Moore,

2005; Cheney, et al.,, 2009; Jolivette, Wehby, Canale & Massey, 2001; Rafferty & Raimondi, 2009; Walker, et al.,, 2009). Collateral effects on academic areas not directly addressed by the intervention show inconsistent results (Cheney, et al., 2009; Walker, et al., 2009; Wehby, et al., 2003).

Table 2
Behavioral Intervention Outcomes

Author	Participants	Intervention	Outcomes
Alber, Anderson, Martin & Moore (2005)	Grades 4-6: four students with EBD	**Behavior:** Recruitment training	**Behavior:** all students increased appropriate recruitment responses per session **Math:** increased accuracy and problem completion
Cheny, Stage, Hawkens, et al.,. (2009)	Grades 1-5: 121 students at-risk for EBD	**Behavior:** Check, Connect, Expect	**Behavior:** 2 of 3 improved on-task behavior **Academic:** no statistical increase over time
Jolivette, Wehby, Canale & Massey (2001)	Grades 1-2: three students with EBD	**Behavior:** choice-making opportunities	**Behavior:** increase in on-task behavior, decrease in off-task and disruptive behavior, no impact on group contingency implementation **Math:** 2 of 3 increased number of problems attempted
Rafferty & Raimondi (2009)	Grades 2-3: five students with EBD	**Behavior:** self-monitoring attention and performance	**Behavior:** Self-monitoring of performance was more effective than self-monitoring attention for increased on-task behaviors **Math:** Self-monitoring performance more effective than attention for increased problems correct
Walker, Seeley, Small et al.,. (2009)	Grades 1-3: 200 students at-risk for EBD	**Behavior:** First Steps to Success	**Behavior:** moderate to strong effects reducing disruptive behaviors **Reading:** Letter-Word Identification & Oral Reading Fluency not sensitive to the intervention

Supporting student behavior requires a variety of strategies and skills from educators. The RtI model provides researched best practices to support educators through this process, and ensures that classroom teachers are not alone in meeting student diverse needs. However, RTI models are built around the importance of predictive statistics, and few predictive statistics currently exist for Emotional Behavioral Disorder (Bradley, Dolittle, & Bartolotta, 2008).

Social cognitive theory. Disruptive behavior is a function of complex human nature and can best be understood through models such as Social Cognitive Theory. Bandura (1986)

advanced Social Cognitive Theory and the importance of self-beliefs by describing human functioning as a product of a dynamic interplay of personal, behavioral, and environmental influences. More specifically people are more than reactive organisms shaped by their environment or driven by inner impulse [more than Pavlovian dogs]; people are viewed as self-organizing, proactive, self-reflecting and self-regulating (Pajares, 2002). Social Cognitive Theory allows therapists and counselors to direct strategies at personal, environmental and behavioral factors (Pajares, 2002). Using Social Cognitive Theory as their framework, teachers can work to improve their students' emotional states and to correct their faulty self-beliefs and habits of thinking (personal factors), improve their academic skills and self-regulatory practices (behavior), and alter the school and classroom structures that may work to undermine student success (environmental factors) (Pajares, 2002).

Social Cognitive Theory (SCT) provides a comprehensive and well-researched, conceptual framework for understanding the factors which influence behavior and the necessary processes through which we learn behaviors. Schools' attempts to address disruptive behavior interventions to mitigate external and internal behaviors, and these may include counseling and social skills development among others. Vygotsky's theory of socio-cultural development fits with current neuropsychological understanding and practice. Vygotsky viewed self-regulation as a generalized trait or stage of competence that children develop by the early elementary grades (Vygotsky 1962/1978 as cited in Schunk and Zimmerman, 1997, p. 198). Vygotsky's theories are actionized through guidelines and practices for caregivers (Morris, 2015) such as *Tools of the Mind*. *Tools of the Mind* are intended to increase children's resilience, problem solving and self-regulation strategies, and adults can support children in the development of these skills Table 3 below (Bedrova & Leong, 2007):

Table 3.
Tools of the Mind (Bedrova & Leong, 2007)

1. Talk through procedures, events and happenings with children as this helps give a structure to their experience.
2. Model "private speech" when you demonstrate things for children and encourage them to use private speech themselves.
3. If a young child says, "No, no, no" but then carries out the action that s/he clearly has some awareness is wrong, interpret this as a sign that the child is on the journey towards internalizing the behavioral requirements. Be positive, for example, "That's right, Chris. We don't want to jump in the deep puddles before putting [boots] on. Now you'll need to change into dry socks."
4. Encourage children to plan their plan. At its simplest, this starts with children making a choice of which activity they want to do. Later this develops into a drawn or written plan with children indicating what they want to do, what they will need for it, who else will be involved and how. To begin with, planning takes place immediately before the play. Later, planning may stretch ahead.
5. Accustom children to reviewing their play and activities before they move on to something else. Again, gradually increase the challenge of the "review," working towards a continuous cycle of review informing a new plan, and so on.
6. Give young children roles – being as quiet as a mouse, as still as a soldier on sentry duty.
7. Provide visual cues for roles, for example, children hold a picture of an ear when they are in pairs and it is their turn to listen, they have the picture of a mouth when it is their turn to talk.
8. When learning particular skills, get children to pick out the best example of the skill in their own and other people's work or behavior.
9. Use external mediators to help children regulate their behavior, for example, a carpet square to 'contain' a restless child for short periods of sitting on the carpet. Make sure to use external mediators in a manner where they are a tool to help the child along the way to internal control.

SCT implicated self-efficacy, the belief in one's ability to perform a certain task, as a pivotal construct in understanding and modifying human behavior (Fertman & Primack, 2010). Self-efficacy is pivotal in the development of autonomy. An individual's belief about his ability to perform a task or withstand a difficulty will determine how they will behave. People who doubt their abilities may avoid difficult tasks, set low expectations, and make minimal commitments to goals. However, if he has strong belief is ability, will approach difficulties as challenges, feel in control and maintain commitments, and persists when their efforts fail. In

addition, strong self-efficacy supports positive social relationships, while insecurity tends to alienate others. However, maintenance of social relationships are not self-forming. Children must find, create and support their relationships for themselves.

Executive functions and the measurement of self-efficacy.

Development of executive function skills in normal children has a common variance with age (Morris, 2015). Morris describes the normal development process, behavior and executive function skills for children, and how the relationship with primary caregivers provides for children what they need to meet their three psychological needs: relatedness, autonomy and competence. Positive behavior is promoted by providing environments that enable people to meet their psychological needs, and as they grow children internalize the behavioral expectations of their communities. The way in which this internalization takes place has long-term consequences for their behavior and well-being (Morris, 2015).

> *According to the Center on the Developing Child at Harvard University, children aren't born with these skills—they are born with the potential to develop them. If children don't get what they need from their relationships with adults and the conditions in their environments—or (worse) if those influences are sources of toxic stress—their skill development can be seriously delayed or impaired. Adverse environments resulting from neglect, abuse, and/or violence may expose children to toxic stress, which disrupts brain architecture and impairs the development of executive function.*

Executive function and self-regulation relies upon three types of functions of the brain, and these functions are highly interrelated and operate in coordination with each other: working memory, mental flexibility, and self-control. Working memory governs our ability to retain and manipulate distinct pieces of information over shorter periods of time. Mental flexibility helps us to sustain or shift attention in response to different demands or to apply different rules in different settings. Self-control enables us to set priorities and resist impulsive actions and responses. In recent years the treatment of executive functions gained widespread interest among

clinicians, mental health professionals, and parents of children with disruptive behaviors (Barkley, 2014). Executive functions include the following abilities (Malloy, Cohen & Jenkins, 1998, p. 574):

1. Formulating goals with regard for long-term consequences.
2. Generating multiple response alternatives.
3. Choosing and initiating goal-directed behaviors.
4. Self-monitoring the adequacy and correctness of the behavior.
5. Correcting and modifying behaviors when conditions change.
6. Persisting in the face of distraction.

A review of the research also shows a relationship between executive function and aggressive behaviors.

- Only 28% of toddlers show little or no aggression (Tremblay, Nagin, Seguin, et al., 2004).
- At 17 months, most children display aggression toward adults, siblings and peers (Singer and de Haan, 2007).
- Most of these show slightly increasing aggression over the period until they are 31/2 years old. Their levels of aggression then drop before they are 5 years old (Tremblay, et al., 2004).
- 14 percent of children become much more aggressive over the same period and these are the children at serious risk of long-term problems and poor outcomes (Tremblay, et al., 2004).

- 2- and 3-year olds used coercive methods in 91 percent of clashes in childcare settings, and in 42 percent of cases this was physical aggression (Singer and de Haan, 2007).

Self-management is gaining popularity in fields outside of education. Recent studies have targeted interventions in self-efficacy related to a variety of health concerns among children including fat and sugar intake (Rinderknecht & Smith, 2004), seizure disorder management (Caplin, Austin, Dunn, Shen, && Perkins, 2002), and health behavior choices such as not to use drugs (Cullen, Baranowski, & Smith, 2001). Self-efficacy beliefs have been found related to clinical problems such as phobias (Bandura, 1983), addiction (Marlatt, Baer, & Quigley, 1995), depression (Davis & Yates, 1982), social skills (Moe & Zeiss, 1982), assertiveness (Lee, 2012, 1984); to stress in a variety of contexts (Jerusalem & Mittag, 1995); to smoking behavior (Garcia, Schmitz, & Doerfler, 1990); to pain control (Manning & Wright, 1983); to health (O'Leary, 1985); and to athletic performance (Barling & Abel, 1983; Lee, 2012).

Usher and Pajares (2008) asserted that self-efficacy for self-regulated learning scores would be positively correlated with indexes of self-efficacy, self-concept, task goal orientation, and academic achievement and negatively correlated with indexes of academic anxiety (p. 446). They go on to state that self-efficacy for self-regulated learning could inform and offer a predictive construct for academic task achievement (Usher & Pajares, 2008). This construct could provide an alternative to Behavior Rating Scales in assimilating data for decision making in identifying students with EBD. Recent studies of self-efficacy demonstrate the impact it can have on success in school and in many other areas:

1. Academic Performance—self efficacy and self-regulation have simple and multiple significant correlation with academic performance in students with School-Refusal Behavior (Khanehkeshi & Ahmedi, 2013).
2. Prosocial Behavior—empathetic self-efficacy has a positive association with prosocial behavior (Eklund et al.,, 2012).
3. Self-regulated Learning—self-efficacy varies during learning,that students consider multiple aspects of performance to inform their efficacy judgments, and that changes in efficacy influence self-regulated learning processes and outcomes (Lent & Hackett, 1987).
4. Aggression—self-efficacy was found to significantly and partially mediate the relationship between approval of aggression and proactive aggression for both genders (Hadley, Mowbray & Jacobs, 2017).

Self-efficacy research has focused on different roles in education. Researchers have explored the link between efficacy beliefs and academic choices of college students, particularly in science and mathematics (Lent & Hackett, 1987). A second area suggests that the efficacy beliefs of teachers are related to their instructional practices and to student outcomes (Ashton & Webb, 1986). In a third area, researchers report that students' self-efficacy beliefs are correlated with motivation constructs and with students' academic performances and achievement (Bandura, 1993; Bandura, 1997). Motivation constructs includes goal setting, modeling, problem solving, test and domain-specific anxiety, reward contingencies, self-regulation, social comparisons, strategy training, other self-beliefs and expectancy constructs, and varied academic performances across domains (Bernacki, Nokes-Malach & Aleven, 2015; Bursch, Tsao, Meldrum & Zelter, 2006; Ecklund, Loeb, Hansen & Anderson-Wallin, 2012; Fertman &

Primack, 2010; Gnagey, 1983; Hadley, Mowbray & Jacobs; Khanehkeshi & Ahmedi, 2013; Minter & Pritzker, 2015; Pajares, 1996; Pajares, 2002; Zimmerman, 1989.). Self-efficacy judgments are task and situation specific, and individuals use these judgments in reference to particular types of goal. Self-efficacy beliefs differ from the related concept of self-belief in their situational nature (Bandura, 1993).

There are four major sources that contribute to the development of self-efficacy beliefs (Bandura, 1977):

- ***Performance accomplishments***: The experience of mastery influences your perspective on your abilities. Successful experiences lead to greater feelings of self-efficacy. However, failing to deal with a task or challenge can also undermine and weaken self-efficacy
- ***Vicarious experience****:* Observing someone else perform a task or handle a situation can help you to perform the same task by imitation, and if you succeed in performing a task, you are likely to think that you will succeed as well, if the task is not too difficult. Observing people who are similar to yourself succeed will increase your beliefs that you can master a similar activity
- ***Verbal persuasion***: When other people encourage and convince you to perform a task, you tend to believe that you are more capable of performing the task. *Constructive* feedback is important in maintaining a sense of efficacy as it may help overcome self-doubt
- ***Physiological states****:* Moods, emotions, physical reactions, and stress levels may influence how you feel about your personal abilities. If you are extremely nervous, you may begin to doubt and develop a weak sense of self-efficacy. If you are confident and feel no anxiety or nervousness at all, you may experience a sense of excitement that fosters a great sense of self-efficacy. It is the way people interpret and evaluate emotional states that is

important for how they develop self-efficacy beliefs. For this reason, being able to diminish or control anxiety may have positive impact on self-efficacy beliefs.

Research cautions against the thinking that self-efficacy may soon also come in a kit (Bandura, 1986). Bandura (1986) emphasized that mastery experience is the most influential source of self-efficacy information has important implications for the self-enhancement model of achieving behavior goals. Self-enhancement proponents emphasize educational efforts that focus on improving students' self-beliefs in order to improve goal attainment. Social cognitive theorists focus on raising competence and confidence through authentic mastery experiences. Decades ago, Erik Erikson (1959;1980) put it this way:

> *Children cannot be fooled by empty praise and condescending encouragement. They may have to accept artificial bolstering of their self-esteem in lieu of something better, but what I call their accruing ego identity gains real strength only from wholehearted and consistent recognition of real accomplishment, that is, achievement that has meaning in their culture. (p. 95)*

Low self-efficacy has a profound impact on a persons' view of the world. Bandura (1993) sums up the impact of low self-efficacy related to a task:

1. People who have a low sense of efficacy in a given domain may withdraw from difficult tasks.
2. They have lower aspirations and a weaker commitment to the goals they choose to pursue.
3. They do not concentrate on how to perform well. Instead they spend much of their energy on focusing on limitations and failures.
4. When faced with difficult tasks, they are plagued by their personal deficiencies and the obstacles they might encounter. They decrease their efforts and quickly give up in the face of challenges.

5. They are slower to recover their sense of efficacy following failure or setbacks because they perceive their insufficient performance as an expression of their insufficient capabilities.

Research focused on defining and measuring the construct of self-efficacy has explored the impact of school interventions on student levels of self-efficacy, and some have also measured the impact self-efficacy has on academics (Bandura, 1993; Bandura, 1997; Bernacki, Nokes-Malach & Aleven, 2015; Bursch, Tsao, Meldrum & Zelter, 2006; Ecklund, Loeb, Hansen & Anderson-Wallin, 2012; Fertman & Primack, 2010; Gnagey, 1983; Hadley, Mowbray & Jacobs; Khanehkeshi & Ahmedi, 2013; Minter & Pritzker, 2015; Pajares, 1996; Pajares, 2002; Zimmerman, 1989.) Experimental designs in which self-efficacy is systematically raised to differential levels speak more directly to the issue of causality than those of multivariate relationships (Bandura, 1977). The procedure of testing multivariate relationships between domain-specific academic measures of self-efficacy, other motivation constructs, and performance attainments is an improvement over less complex analyses (Pajares, 1996). Providing insights regarding the causal influence of self-beliefs will require experimental designs and longitudinal studies (Pajares, 1996). Findings from investigations in which this has been accomplished suggest that self-efficacy beliefs make a causal contribution to the level and quality of human functioning (Bandura, 1997). Using the hypothesized sources of efficacy information, beliefs can be altered using

1. vicarious methods,
2. verbal persuasions,
3. differing performance feedback,
4. social comparative information,

5. manipulating task complexity.

Gnagey (1983) studied the effect of teacher feedback on high school students' academic achievement. Teachers were asked to provide feedback to students on their papers, projects and tests in the following ways: Experimental Group Feedback was given to ascribe the student's efforts with the results, and was on a scale from "Shows very hard work" to "Needs more work"; and Placebo Group Feedback was written by the teacher on student work as only "Superior, Excellent, Average, Below Average and Poor." The study found significance in two of the three areas measured: transfer of skills to out of school areas such as crime and the positive effect effort- ascribed teacher feedback had in changing key attitudes of the most disruptive students in a high school toward writing instruction (Gnagey, 1983). Gnagey (1983) concluded that student self-efficacy is a powerful and practical tool to improve student quality of life.

A sample of studies implementing multi-component interventions for students at risk for EBD are described in Table 4 and Table 5 below. Positive academic and behavior outcomes demonstrated in these studies suggest that a multi-component intervention approach is effective. The exception is the Lane & Menzies (2003) study, and the authors attribute the lack of positive impact on behaviors as a result of primarily addressing reading instruction with secondary focus on social skills instruction (Lane & Menzies, 2003).

Table 4**.**
Multi-component intervention outcomes

Author	Participants	Intervention	Outcomes
Blood, Johnson, Ridenour, Simmons &Crouch (2011)	Grade 5: one student with EBD in self-contained classroom	**Math:** routine small-group math instruction **Behavior:** video-modeling , self-monitoring	**Math:** not evaluated **Behavior:** substantially approved on-task behaviors and decreased to low levels disruptive behavior
Carter, Lane, Crnobori, Bruhn & Oakes (2011)	Grades K-12: review of previous studies; 3,958 students with EBD in special education & general education settings	**Academic:** routine learning activities in all content areas **Behavior:** self-management & self-regulation strategies	**Academic:** not evaluated **Behavior:** improved socio-behavioral outcomes
Cleary, Velardi & Schnaidman (2017)	Middle grades in inclusive setting	**Math:** routine small-group math instruction **Behavior:** Self-regulated empowerment program (SREP)	**Math:** statistically significant & positive trend in math academic scores over two years **Behavior:** medium to large effect size, statistically significant group differences
Denune, Hawkins, Donovan, Mccoy, Hall & Moeder (2015)	Grade 6: 14 students with EBD in alternative school setting	**Language arts:** routine whole group instruction **Behavior:** self-monitoring to increase effectiveness of existing inter-dependent group contingency intervention	**Language arts:** not evaluated **Behavior:** increase in on-task behavior, decrease in off-task and disruptive behavior, no impact on group contingency implementation
Gulchak (2008)	Grade 3: one student with EBD in self-contained classroom	**Reading:** routine one hour reading instruction **Behavior:** self-monitoring using handheld mobile computer	**Math:** not evaluated **Behavior:** increase in on-task behavior

Table 5**.**
Multi-component intervention outcomes continued

Harris, Oakes, Lane & Rutherford (2009)	Grade 1: at-risk for EBD & reading	**Reading:** Sonday System & Great Leaps Reading **Behavior:** reinforcement system	**Reading:** improvements in Nonsense Word Fluency (NWF) & Oral Reading Fluency (ORF) **Behavior:** improvements in externalizing and internalizing behaviors
Lane & Menzies (2003)	Grades 1-6: at risk for behavior and reading	**Reading:** John Shefelbine's Phonics Chapter Books **Behavior:** social skills training	**Reading:** statistically significant improvement in reading skills **Behavior:** no significant decrease in negative comments
Lane, O'Shaughnessy, Lambros, Gresham & Beebe-Frankenberger (2001)	Grade 1: seven at-risk students for EBD and reading achievement	**Reading:** Phonological Awareness Training for Reading **Behavior:** group-contingency for participation	**Reading:** substantial gains in NWF & ORF **Behavior:** decreased disruptive behavior, decreased negative social interactions for 6 of 7
Nelson, Martella & Marchand-Martella (2002)	Grades 1-5: at-risk for EBD	**Reading:** Sound Partners (tutoring) **Behavior:** PBS-Think Time, Talk It Out, SOS Help for Parents, FBA/BIP	**Reading:** substantial improvements for target students on Woodcock-Johnson Revised Tests of Achievement **Behavior:** substantial improvement in social competence
Wills & Mason (2014)	High School: two students, one with Specific Learning Disability and the other with Attention Deficit Hyperactivty Disorder, inclusive general education science classroom	**Science:** routine whole-group science instruction **Behavior:** self-monitoring application on a handheld tablet	**Science:** not evaluated **Behavior:** increase in on-task behavior for both students, less clear improvement in disruptive behavior for both students
Voigt-Zabinski (2017)	Elementary: review of studies on elementary children with EBD	**Academic:** routine learning activities in all content areas **Behavior:** peer-assisted learning, self-monitoring, praise, & choice-making	**Academic:** not evaluated **Behavior:** increase in on-task behaviors

Academic content has become an important part of behavior research design, but as you can see in Table 4 and Table 5 above most studies have not included measures of academic achievement in order to evaluate and begin quantifying the impact behavior interventions have on math, reading and science achievement. Interestingly, almost all of these studies discussed the need to include appropriate academic measures, along with the measures of behavior, in future studies.

Intervention Treatment

The purpose of this quantitative study is to investigate multi-component mathematics and behavior intervention targeting student self-efficacy for on-task behavior in general education mathematics classrooms for elementary students with Emotional Behavioral Disorder (EBD.) The study includes a purposive sample of 4th grade students in a public elementary school setting who are currently participating on a Tier II or Tier III behavior plan due to disruptive classroom behavior and who also are performing at the 25th percentile for their grade level for mathematics achievement.

The goal is to support the development of self-efficacy beliefs in students with EBD. Teachers will provide the ECM mathematics whole-group instruction, and they will also take on the role of student coaches/mentors during the Treatment sessions helping the children to select and reflect on their behavior goals during mathematics instruction. Teachers will meet with the students for the Coaching Session, and they will review the child's self-scored behavior they gave themselves on how well they met their goal every 10 minutes during the 50-80 minutes of math instruction. For math instruction and for coaching sessions, teachers will be encouraged to use effort-ascribed feedback with the students. Mastery experiences in mathematics through students' productive participation in Extending Children Mathematically (ECM) will be the goal

of the Self-Efficacy Coaching Session. Increased student engagement through on-task behaviors during math lessons is also a goal.

Chapter III

Methodology

This study is designed to investigate the impact of student self-efficacy on disruptive behavior and mathematics achievement. The intent is to determine how multi-component mathematics and behavior interventions targeting elementary students with Emotional Behavioral Disorder (EBD) could impact student self-efficacy for on-task behavior during math instruction, reduce disruptive behavior and increase mathematics achievement in the inclusion classroom. In addition, this study investigates teachers' ability to implement the intervention with fidelity, explores teacher's use of effort-ascribed feedback with students. The study also seeks to determine student and teacher satisfaction with the intervention as an important factor of sustainability. A quantitative design is the most effective method for the research study since it offers a non-obtrusive approach to the inquiry and potential identification of significant relationships among study variables (Morgan, 2014).

This chapter describes the design of the study, beginning with descriptions of the participants and setting, and then delineating the research design, dependent variables, methods to promote validity of the research, the definitions of the independent variables and general procedures. Finally, the methods of data collection and analysis are described.

District Setting

The demographic characteristics of the participating public school district in Arkansas with an enrollment of 14,341 students are presented in Table 6. Across the entire district population, the average percentage of minority students was approximately 58%, of that 34% were Hispanic/Latino, 11% were Black/African American and 6% were two or more races. The majority of the district population is represented by students from low socio-economic status

with 72% eligible for free or reduced lunch. Additionally, 28% of students in the district are identified with Limited English Proficiency and 12% of students in the district qualify for special education services under IDEA.

Table 6.
Demographic characteristics of the district population.

Demographic Characteristics	Percentage
Hispanic	34%
Black/African American	11%
Two or more races	6%
White/Caucasian	42%
Low Socio-Economic	72%
Limited English Proficiency	28%
Students Eligible for Receiving IEP services	12%

School Setting

The school setting was selected because of their school-wide implementation of Positive Behavior Support (PBS). They are in their first year of implementation, and they have some procedures in place and are still working to define a building-wide behavior matrix and other PBS components.

The demographic characteristics of the participating school are presented in Table 7. Across the entire school population, the average percentage of minority students was approximately 81%, of that 54% were Hispanic/Latino and 17% were Black/African American. The majority of the school population was represented by students from low socio-economic status with 98% eligible for free or reduced lunch. Additionally, 52% of students in the school are identified with Limited English Proficiency and 13% of students in the school qualify for

special education services under IDEA. The school has a high mobility rate: approximately 25% of students transition in or out throughout the year.

Table 7
Demographic characteristics of the school population.

Demographic Characteristics	Percentage
Hispanic	54%
Black/African American	17%
Asian	8%
White/Caucasian	19%
Low Socio-Economic	98%
Limited English Proficiency	52%
Students Eligible for Receiving IEP services	13%

Four classrooms were initially selected for inclusion in the study according to the following inclusion criteria: (a) the teachers had no previous experience with implementing self-efficacy coaching to manage behaviors, (b) the student population included one or more minority students who demonstrate high rates of disruptive behavior, (c) the student population included one or more students with a disability who, according to teacher reports, demonstrate high rates of problem behavior, (d) the student population included one or more minority students who were behind in mathematics achievement, (e) parents of target students in the classroom consent to their child's participation in the study, (f) all targeted students in the classroom consent to participation in the study and (g) all teachers at the selected grade level volunteer for participation in the study. The independent variable was only introduced in two of the four participating classrooms due to requirement (g) above for all teachers at the selected grade level to volunteer for participation in the study.

Potential participants were elementary students, ages 9-11. The students attended a public elementary school in 4th grade inclusion/co-teaching classroom setting of 25-28 students in each classroom. The researcher observed in 4th grade classrooms where the teachers had volunteered to participate in the study. Two 4th grade teachers were invited to participate through an informed consent form with information about the study, and the researcher was available for teachers if they had questions. Two teachers gave consent in writing and participated in the study. Data were not recorded on the behavior of the special education teachers or paraprofessionals who were present in the classrooms during some observations of math instruction. All forms were collected prior to teacher interviews and data collection. Demographic data of participating teachers are presented in Table 8. Pseudonyms are used to protect teacher confidentiality.

Table 8
Demographic data of participating teachers.

Teacher Name	Gender/Age	Years Exp/At this school	Grades Taught
Burnett	F/25	3/3	3, 4, 5
Hill	F/36	3/3	3, 4

Teacher Burnett described her philosophy of classroom discipline as heavily focused on choice and second chances, with clear procedures in place for behavior. She emphasized a growth mindset (Dweck, 2006). Teacher Hill described her philosophy as focusing on the individual child and his/her specific needs, and she emphasized the importance of procedures for everything.

Target students included in the study were three to five students in each class recommended by the teacher as exhibiting both high rates of disruptive behavior and below-grade-level mathematics achievement. All recommended students in each class were invited to participate, and a consent form with information on the study activities which would involve the

child was sent home with each child. The researcher was available during parent-teacher conferences at the school in order to answer questions families might have had regarding the study. All parents of the targeted students chose to participate, and their children were included in data collection. In addition, once parent consent was received in order to gain student buy-in, the researcher and teacher distributed student consent forms to each of the eight target students, and the researcher was present to answer any questions the students had regarding their participation in the study.

The two participating classrooms are in year one implementing Positive Behavior Support (PBS) as a part of their school-wide implementation; These two classrooms are implementing Live School as a part of the positive reward system, and students can individually earn points for following classroom procedures, such as silent reading upon return to classroom from recess or following directions of cafeteria supervisors during lunch. In addition, students can earn points as a class by getting compliments from others, which awards every child in the class a point. Students can use these Live School points to purchase classroom rewards, such as teacher-provided items like small games and books, and to purchase school rewards, such as Kona Ice and supplies through the school store. Students each have individual Live School accounts, and they use classroom Chromebooks to login and check their accounts. Additionally, "paystubs" can be printed Monday through Saturday, and if parents sign the "paystubs" and students return them to school, students earn Live School points. It is interesting to note that both of these teachers taught 3rd grade last year, and they looped up with the students to 4th grade.

The school is participating in the Arkansas Department of Education pilot for Solution Tree's Professional Learning Communities (DuFour, DuFour, Eaker, & Many, 2010), and these teachers use a system of Common Formative Assessments (CFA) and Common Summative

Assessments (CSA) for each of their five units in mathematics. Each mathematics unit is made up of four to six Learning Targets, and they are written in student-friendly language in the form of "I can…" statements. These Learning Targets are assessed through one CFA per Learning Target and again through the CSA. Scores are determined for each Learning Target, and those are converted to percentages. Students' Mastery of each Learning Target fits into one of three categories, which are aligned with ACT Aspire standards (in parenthesis): Starting (In Need of Support), Almost There (Close), and Got It! (Proficient and Advanced) (Arkansas Department of Education, nd.

Behavior and academic interventions are largely handled by classroom teachers. However, the school employs several paraprofessional aides, who pull small groups from classrooms for literacy and math interventions. Additionally, the school counselor pulls students for behavior groups to work on conversational skills, organization, positive social skills and to share videos to model appropriate behavior.

Each school day begins with a mathematics spiral review from 8:00-8:30, and the daily math block is from 8:30-9:50. The math block includes whole group instruction, small group instruction where the teacher meets with students in small groups so they can redo their classwork or provide additional instruction, and guided practice time. A special education certified teacher pushes into the classroom from 12:30-1:00 daily, which is during the class writing instruction, and also one to two times weekly during the math block. The teachers use the Arkansas Common Core Standards for mathematics, and they pull from a variety of instructional resources in order to implement Extending Children Mathematically (ECM). The district uses the NWEA Measures of Academic Progress (MAP GROWTH) assessment three times a year as beginning and middle-of-year measures, fall, winter and spring. The state ACT Aspire

assessment is used as the end-of-year assessment, and it is given in late April. A special MAP GROWTH assessment will be scheduled for the target students from these classrooms in May at the conclusion of the intervention. CFA and CSA data are tracked by students digitally, and they also keep a binder at their desks with their graded CFA and CSA assessments.

Participants

For this study, a purposive sampling was used. A purposive sample is a form of non-probability sampling where the participants are chosen due to being information-rich cases related to the phenomena of interest (Urdan, 2005). I identified potential elementary schools based upon their location, implementation of school-wide PBS, heterogeneous grouping of students, and identification or risk as students with Emotional Behavioral Disorder.

Target students included in the study were 3-5 students in each classroom nominated by teachers with below-grade-level mathematics achievement and who have been identified with Emotional Behavior Disorder (EBD) or who exhibit high rates of disruptive behavior similar to EBD. The high-rates of disruptive behavior was verified by the researcher during initial observation sessions. Demographic data of target students are presented in Table 9, and pseudonyms are used to protect student confidentiality. The eight target students range in age from 9-11, and seven were male and one was identified as Limited English Proficiency, with the primary language being Spanish.

Table 9.
Characteristics of target students.

Student Name	Gender	Age	Language	IEP Services	LEP
Jayshon	M	10	English	No	No
Juanita	F	11	Spanish	No	Yes
Shakon	M	11	English	No	No
Jeremy	M	11	English	Yes	No
Stoney	M	10	English	No	No
Chris	M	10	English	No	No
Jerome	M	10	English	No	No
Shawn	M	10	English	No	No

Confidentiality

Permission to conduct this study was granted from the University of Arkansas Intuitional Review Board (see Appendix A), as well as the administration of the elementary where the study was conducted (see Appendix B). Permission to participate in this study was obtained prior to commencement of this project. A letter along with an Informed Consent (see Appendix C) was sent home with each student in the appropriate language, and a signature from the parent of guardian was obtained before data for that child were reported. The Informed Consent explained the purpose and procedures of the study. It also explained that participation was completely voluntary and that there were no rewards for participating nor penalties for not participating. It explained that the child could withdraw from the study at any time without penalty. All information was kept confidential to the extent allowed by applicable State and Federal law and University policy. Confidentiality was assured and maintained by the researcher through the establishment of a code. Each student was assigned a number at random to establish the code. All data were recorded and reported anonymously using the code. Only the researcher had access to the code, and all data were kept in a secure locked file cabinet or with the researcher on a computer that was password protected. Once the study is successfully defended, the code will be destroyed.

Data Collection

Data will be collected before, during and after the Intervention Treatment. Prior to Treatment, the students completed three Measures of Academic Progress (MAP GROWTH) assessments as part of the school assessment plan. This mathematics data will be used to identify potential participants for the study. Data will be collected through the study to measure student on-task behavior and mathematics achievement.

Evaluation instruments. Student data will include the *Strengths and Difficulties Questionnaire* as an indirect measure to estimate level of self-efficacy and overall mental health (Goodman, 2001); *Multiple Intelligences Student Survey*; MAP GROWTH, classroom Common Formative Assessments and Common Summative Assessments data to measure achievement in math; discipline data and Behavior Goal Rating Sheets to measure student on-task behavior during math; and attendance data as measure of students' opportunity to learn. At the conclusion of the Intervention, students will complete the IRP-15 Consumer Satisfaction Survey to measure of social validity. Teacher data will include use of effort-ascribed feedback; time logs for Mentor Coaching sessions to measure of fidelity of intervention implementation; and the IRP-15 Consumer Satisfaction Survey after the Intervention ends.

MAP Growth. Northwest Education Association (NWEA) is a research-based, not-for-profit organization, which developed *MAP Growth* as an interim assessment for mathematics, literacy, and science for grades K-10 (NWEA, 2013). It is a computer-adaptive educational assessment, and it is being used to measure achievement and growth for target students in mathematics. The data represent academic gains/losses measured throughout the school year. In addition, NWEA uses student data to compare against national norms for both growth and

achievement. NWEA uses statewide data to project results for students on the Arkansas accountability assessment, ACT Aspire.

Strengths and difficulties questionnaire. The Strengths and Difficulties Questionnaire SDQ is developed by Dr. Robert Goodman, and it is a part of the Development and Well-Being Assessment (DAWBA) family of mental health measures. Assessments are available for both children and adults, and the age range is 24 months and over. It consists of 25 self-reported items which assess five categories: emotional distress, behavioral difficulties, hyperactivity and concentration difficulties, difficulties getting along with other children, and kind and helpful behavior. Composite scores are generated for each of the five categories, and a sixth score: overall stress. Each composite score falls into categories based on range, and students are characterized as showing Very High, High, Slightly Elevated, Average, Slightly Low, Low or Very Low levels of each strength or difficulty. SDQ for ages 5-17 is being used as a related indirect measure and measure of general performance (Goodman, 2001).

Multiple intelligences student survey. This survey is a student interest survey created by classroom teacher Amber Thomas, and she has shared it online. It is based on the *Theory of Multiple Intelligences* by Howard Gardner, and it uses child-friendly language for students to choose things they "like." Based on students' self-reported answers, it measures relative strengths and weaknesses among Gardner's Multiple Intelligences: Linguistic Intelligence, Logical-Mathematical Intelligence, Spatial Intelligence, Musical Intelligence, Bodily-Kinesthetic Intelligence, Interpersonal Intelligence, Intrapersonal Intelligence and Naturalistic Intelligence Gardner & Hatch, 1989). The data were used to plan incentive rewards. In addition, the Multiple Intelligences data were reviewed for commonalities among students, and it may point to potential internal or external motivation for classroom disruptive behaviors.

Common formative assessments (CFAs) and common summative assessments (CSAs). CFAs and CSAs are classroom teacher-made assessments, which are tied to Learning Targets. Teams of teachers identify assessment components are from key content, and the team all agrees to administer the same (common) assessments throughout the year (DuFour, DuFour, Eaker, & Many, 2010). The model was developed through a professional development model called *Professional Learning Communities.* The assessments measure student proficiency toward agreed upon Learning Targets. This data represent growth and mastery of grade-level standards in mathematics.

Discipline data. Student discipline data are collected as a part of PBS. It includes referrals which are made to the school office and result in Out-of-School Suspensions and In-School-Suspensions. It measures extreme behaviors, and it will be used as a component to measures disruptive behaviors.

Behavior goal rating sheets. These behavior rating sheets are a measure student on-task behavior based upon Direct Observation Data by teachers. Students and teachers will meet to select one or two goals specific to each child for on-task behaviors as defined in this study for mathematics class (See Appendix D). The behavior rating sheets are completed everyday. Scores are given on a 10-minute sampling schedule and based on how well a child is meeting his goals: three eagles is "Amazing at meeting goals," two eagles is "Partially meeting goals," and one eagle is "Not Meeting Goals." The data are used over time to measure potential changes in student on-task behavior during mathematics instruction.

Attendance records. Daily attendance records will be collected, including absences, tardies (called AM tardies) and early check-outs (called PM tardies). This data are used as a measure of students' opportunity to learn.

Teacher effort-ascribed feedback. Data are collected prior to the Intervention and at the end of the Intervention on a frequency count of teacher effort-ascribed feedback given to students. This will include whole-class feedback, feedback given to groups, and also feedback given to individual students. This data are an indication of transferability and sustainability of the intervention.

Mentor coaching time logs. Teachers will keep logs of Mentor Coaching meetings with students. This measures fidelity of implementation, and an 80% completion rate indicates strong implementation. This indicates that Mentor Meetings occurred on 15 of the 19 days over the four weeks of the study.

IRP-15 consumer satisfaction survey. Teachers and students will complete appropriate versions of this Consumer Satisfaction Survey after the Treatment phase of the Intervention (Gast & Ledford, 2014). The survey will be completed by teachers and students at the conclusion of the final Treatment. The survey measures participant satisfaction with the implementation of the intervention. The data are self-reported, and it is a Likert scale from 6 Strongly agree to 1 Strongly disagree. Feedback is gathered in areas relating to the effectiveness, reasonableness and alignment of this intervention to expectations of the participants (Appendix D). This will be used as a measure of Social Validity (Horner, et al., 2005).

Baseline data. Data on the behavior dependent variable were collected during observational sessions during mathematics classes to verify high rates of disruptive behaviors. Baseline data were collected in both classrooms through Direct Observation. The researcher recorded on-task behavior for target students through the observational session. Baseline sessions continued until stable percentages of on-task behavior was demonstrated by target students across three sessions. The researcher also recorded the frequency of teacher effort-ascribed

feedback. During these observations, students were seated in groups of four to six students, and the researcher recorded data for each of the eight target students for up to 30 minutes using a 60-second momentary time sampling (Gast & Ledford, 2014). On-task behavior included attending to the assigned activity; appropriate motor responses such as writing, looking at the teacher, eyes on materials, and using math materials to solve problems; staying in assigned seat or area; and verbal participation. Off-task behaviors included off-topic comments unrelated to math, inappropriate use of materials, non-compliance, and out of seat or assigned area.

All participants' mathematics achievement data were collected using existing MAP GROWTH test RIT scores from fall 2018 to spring 2019. RIT is short for Rasch UnIT. A RIT score is an estimation of a student's instructional level and also measures student progress or growth in school (Goodman, 2001). Figure 3 displays the 2018-19 results for the eight participants. The mean score for each testing window is given in parenthesis in the legend. For example, the mean score for the September 2018 administration of the assessment was 201.9. Only three students scored at or above the mean for that test date: Jayshon, Chris and Shawn. The January 2019 test date had only two students scored at or above the mean (201.9), and the March 2019 scores show that none of the target students were at or above mean. As you can see from the data for all three test administrations in Fig. 3, only one student, Juanita, has experienced consistent positive gains in RIT scores. However, her math achievement is also the lowest of all study participants. No lines around graphs change font to TNR

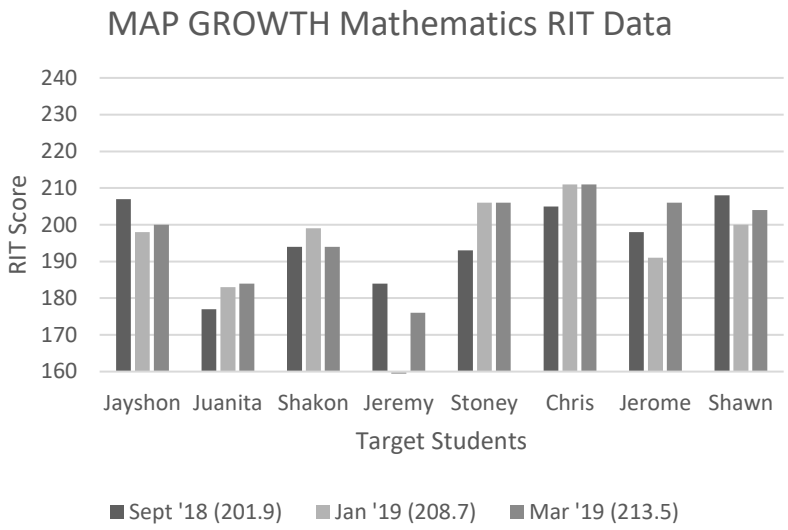

Figure 3. RIT achievement on MAP GROWTH for target students (RIT means).

MAP GROWTH provides for all students in Arkansas a projected result on the ACT Aspire state benchmark, spring assessment. This projection is based on the RIT scores of each student and their growth. MAP GROWTH evaluates mean growth and mean achievement for all students in Arkansas who complete both assessments, and compares each individual child's results to that data. Students ACT Aspire results will place them into one of four categories: Advanced, Proficient, Close, and In Need of Support (NWEA, 2013). Five target students from this study are projected to be Close (Jayshon, Stoney, Chris, Jerome, and Shawn). The other three are projected to be In Need of Support (Juanita, Jeremy, and Shakon). That means that there are no students in this study who are projected to be Advanced or Proficient on ACT Aspire for 2019.

MAPS GROWTH Data were also collected for Number and Operations RIT Scores Fig. 4. The Pre scores were from the September 2018 assessment results and the Post scores were from the March 2019 results. Number and Operation was reported as a relative strength for one student, Stoney, and as an area of focus for a different student, Jerome. Number sense has been

considered a cognitive function (Gelman & Butterworth, 2005; Landerl, et al., 2004), and deficits in Number Sense result in poor counting procedures, slow retrieval of basic facts, and inaccurate computation, which are all characteristics of mathematics learning disabilities (Geary, et al., 2000; Jordan, et al., 2003). See Number & Operations RIT scores in Fig. 4 below.

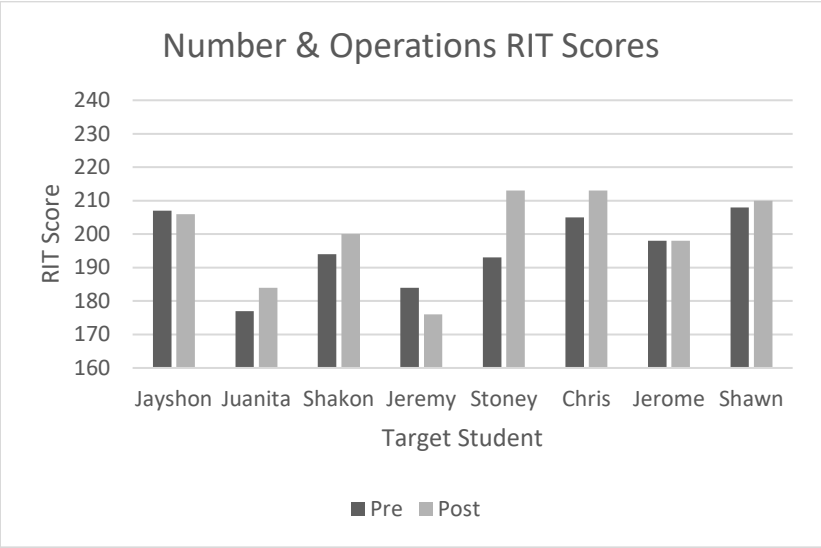

Figure 4. Number and operations RIT scores for target students.

Procedural fidelity. In order to maintain procedural fidelity and limit threats to internal validity (Gast & Ledford, 2014), two procedural fidelity measures were used. A start-up fidelity checklist identified the procedures to teacher students the procedures for the intervention. This checklist was used to initiate implementation of the intervention (Appendix F). The start-up fidelity checklist included the criteria related to initiating the intervention: completion of teacher trainings and trainings for students; and meetings with students to set goals, administer pre-intervention assessments, and plan rewards. The start-up fidelity checklist was reviewed with teachers prior to implementation, and it was completed by both teachers during their second training, prior to the first week of implementation. Teachers also used sample responses for "effort-ascribed feedback" to guide their interactions with students during the coaching sessions

and during math instruction. This was reviewed with both teachers during the second training and prior to the implementation of the intervention.

An additional fidelity measure was used to increase fidelity of implementation of intervention (Appendix G). The Ongoing Fidelity Checklist included teacher responsibilities throughout implementation of the intervention: student daily goal sheets, attendance and daily Coaching meetings with students; use of effort-ascribed feedback; and completion of CFA and CSA assessments. For reliability purposes, the researcher completed the Implementation Fidelity Checklist each week based on observations, and the teachers also completed the same checklist each week. The checklists completed by the researcher and the teachers created two fidelity indices by which to assess validity of implementation fidelity (Horner, Carr, Halle, McGee, Odom, & Wolery, 2005).

Interobserver agreement. To assess reliability of the data collected during all phases of the intervention and limit threats to internal validity (Gast & Ledford, 2014), interobserver agreement was collected weekly during training meetings with teachers. The researcher and the teachers viewed videotaped math lessons and scored students' behavior on the same three-point scale students used to evaluate their on-task behavior goals. The training included multiple opportunities for on-task data collection practice until observers reached 90% agreement. The researcher and the teachers simultaneously recorded data on the behavior dependent variable. The interrater agreement percentage for on-task behavior was calculated with a point-by-point agreement index by dividing the number of agreements by the total number of agreements and disagreements then multiplying that number by 100 (agreements/(agreements + disagreements) x 100) to render a percentage of agreement (Ledford & Gast, 2018). For target student on-task

data, interrater agreement was 90% (range 80%-100%) during baseline and 95% (range 90%-100%) during training and treatment.

Intervention

The study was implemented in two phases: 1) baseline and 2) treatment. Both classrooms provide the intervention and collect data simultaneously. Each participating teacher implemented the student-completed behavior goals sheets during math instruction in their classrooms Monday-Friday. In addition, the teachers decided to award class-wide "compliment points" when the entire class exhibited on-task behavior when prompted by the 10-minute timer sounding. This added an unexpected group-contingency aspect to the intervention, and it allowed all students in the class to add points to their Live School account. Each teacher met with target students individually each day to reflect with the child on the child's progress toward their goal, praising successes and provide support for areas needing growth. Teachers used effort-ascribed feedback during these meetings and during math instruction.

On the first day of intervention implementation, teachers distributed Behavior Rating Scales to target students on clipboards, and they used Direct Instruction with target students using the Eagle tracker online data tracking with the target students to track their daily behavior data. They described the basic procedure for the class to earn "compliment points" for on-task behavior during mathematics when the timer sounded. The teacher set a timer to record the target students' behavior throughout math class. At the beginning of each subsequent instructional session, the teacher reviewed the procedure and reviewed the potential rewards students could purchase from the class store or the school store with their Live School points. With a 10 minute interval, students will have the opportunity to earn three points every 10 minutes or 3 points per 8 intervals during the instructional session, for a total of 24 points. Teachers used effort-ascribed

feedback with the whole class and with individual students “I saw you catch yourself before you blurted out.” “Class, you are doing a great job focusing your attention on me and the smart board.” Teachers privately made note of observations and coaching comments throughout the lesson to use with target students when they met to review the child’s scores later in the day.

Teacher training. Teachers were trained by the researcher across two forty-five minute sessions. Teachers viewed a PowerPoint covering the basic components of the self-efficacy coaching intervention. The training took place at the teacher’s school in their classroom and consisted of the following: (a) coaching strategies for mentoring sessions with students; (b) the procedure for daily mentoring meetings with students (c) the creation of a digital resource for daily student data collection and reflection ; (d) creating daily goals and awarding points; (e) using effort-ascribed feedback statements; (f) rewards and incentives; (g) guidelines and defined terms for on-task behavior; and (h) self-monitoring. Teachers watched multiple videos of math lesson in upper elementary school several times, and each time the researcher and the teachers independently scored on-task behavior of a target student who had been identified prior to starting the video. The target student’s on-task math behavior was rated at 60 second intervals when a timer sounded, using the three point Behavior Rating Scale. Following the rating of each target student, the group discussed their ratings, and compared them to the on-task behavior guidelines and to the score of the others in order to increase consistency of scores across all observers. The teachers reviewed the Start-Up Procedural Fidelity Checklist and the Ongoing Fidelity Checklist associated with initial and ongoing implementation of the intervention. At the conclusion of the training, teachers were given the opportunity to ask questions or share concerns regarding the intervention.

During the training, each teacher participating in the study identified potential goals for target behaviors based on the needs of each targeted student. In order to promote teacher autonomy and buy-in, the teacher identified problem behaviors for target students in her classroom. Together, the teacher and researcher created a list of on-task skills or target behaviors the teacher wanted to see from each targeted student in her classroom which the teacher could use to guide the goal selection conversation. Teachers were provided copies of the *Strengths and Difficulties Questionnaire* and the *Multiple Intelligences Student Survey,* and they were instructed to read aloud the questionnaires to the students individually in order to compensate for potential reading challenges which could impact results.

To promote fidelity, during the training meetings and at the onset of implementation of the intervention in their respective classrooms, teachers received immediate feedback and coaching aligned with the essential components of the intervention as identified on the Start-up Fidelity Checklist and Ongoing Fidelity Checklist. If fidelity dropped below 90% while the teacher implemented the intervention, the researcher provided feedback and modeling of essential components of the intervention immediately following the intervention session for a maximum of ten minutes. During a majority of the feedback sessions, the researcher provided feedback on observed challenges: increasing effort-ascribed feedback orally and in written comments on students work. Teachers struggled with keeping notes on behaviors of target students for use during coaching sessions, and ideas were brainstormed for strategies to simplify this process. Teachers printed labels with each child's name, and they used the on-task and off-task behavior codes from their initial training to quickly record strengths and weaknesses. In addition, feedback was given to teachers to ensure that students received the weekly reward for complying with procedures of the intervention and not for the results of the behavior scores.

Student training. Prior to the implementation of the intervention, teachers used a direct instruction model to teach the concept of self-reflection and the procedure for scoring of goals when prompted. The teachers met with each child individually to assist the child with selecting one or two target behaviors for their goal(s) during math class. The teachers used direct instruction model to teach the students how to complete their daily behavior chart, learned to record their data in Eagle Tracker and practiced with the child using the timer alarm so that they would be familiar with the prompt which would sound every ten minutes. Teachers provided students with rationale for the demonstration of target behaviors related to each child, and they modeled the behavior for the students, including, examples of the target behaviors. Students then had the opportunity to role play the behaviors. The teachers provided feedback and answered questions regarding the on-task behavior expectations. The student training component lasted approximately 10 minutes for each goal.

Daily. The target students participate in the Treatment Intervention of four to five Self-Efficacy Mentor Coaching sessions daily. Teachers meet with each target child and discuss his progress toward goals. The coaching lessons will be provided by the child's classroom teacher during the school day, and they will incorporate the following elements of effective instruction to improve Self-Efficacy in students:

- Establish specific, short-term goals that will challenge the students, yet are still viewed as attainable (Schunk & Pajares, 2002.)
- Help students lay out a specific learning strategy and have them verbalize their plan. As students proceed through their day, ask students to note their progress and verbalize their next steps (Schunk & Pajares, 2002.)

- Compare student performance to the goals set for that student, rather than comparing the student against other students or the rest of the class (Bandura, 1988.)

In addition, the Self-Efficacy lessons target behavior(s) which are challenges for each child. Teachers use effort-ascribed feedback to support the child's development of self-efficacy related to the goals. The lessons also will tie to student interests such as sports, pop culture, movies or technology, and they will allow students to make some of their own choices where appropriate. Other useful tools which may be implemented include peer models, such as videos or watching successful peers, encouraging accurate attributions so that students use language to help them understand that "they didn't meet their goal because they made a poor choice, not because they are stupid or because the teacher hates them." Choicemaking, incorporating interest, intra-task stimulation, and adding structure to a task, all have potential benefit to students with disruptive behaviors (Zentall &Leib, 1985). When the following three conditions are satisfied, students are fully engaged: A sense of competence (I can succeed here), A sense of community (I belong here), A sense of choice (I am trusted to make wise choices here). These conditions are rooted in the research on intrinsic motivation by Ed Deci and Richard Ryan (1995). Target students used a digital spreadsheet to record and monitor their daily behavior points throughout the intervention.

Weekly. At the end of each week of the intervention, target students have the opportunity to earn a reward they selected from the Reinforcement Menu (see below). The rewards are earned by students for completion of the core components of the intervention: (1) rating their own behavior at ten-minute intervals during math time, and (2) meeting each day with their teacher to reflect on their progress toward their goals. Completion of their point sheet during math time is defined as scoring themselves for their goal behaviors at every timer prompt. Students earn the reward for completing those two components, regardless of the behavior scores

they give themselves or of the teachers' assessment of their behavior. The reward is tied to the desired actions of the students and not to the interim outcomes of the actions.

Reinforcement menu. At the onset of student training, the teacher guided the students to complete the Student Interest Inventories, and they used this to collaboratively choose a reward. Students shared ideas, and the teacher recorded the options generated. The items and activities identified created a reinforcement menu and students selected their top few rewards to be shared with the researcher. The reinforcement menu consisted of weekly rewards, such as, technology time, free reading time, small toy, snack, and a bottle of water.

Post data analysis. This study used a multiple baseline design to evaluate the impact of the intervention, which limits threats to internal and external validity. Research Questions 2 exploring the impact Self-Efficacy Coaching strategies has on target students' mathematics achievement will be tested using Independent T-Tests. Independent T-Tests were chosen for testing the hypotheses because research question 2 relates one dependent variable (mathematics achievement) and one independent variable (Self-Efficacy Mentor Coaching strategies) (Creswell, 2003; Tabachnick & Fidell, 2007.) The hypotheses will be tested using Independent T-Tests, using the student scores on the Common Formative Assessments from Units 1 through 5 and Common Summative Assessments from Units 4 and 5. For these comparisons, the dependent variable is the student behavior score or mathematics score. The independent variable is participation in Self-efficacy Coaching strategies.

Results will be presented using visual inspection, assessment of trend data, variability, immediacy, level, magnitude, and descriptive statistics for measured variables including the means, standard deviations, frequencies, percentages. Both research questions will be tested at a

statistical significance threshold of $p < .05$. In addition, teacher use of effort-ascribed feedback, and teacher and student consumer satisfaction will be presented.

Reliability. Data collection include multiple measures for both independent variables. Data for the student behavior checklist will be compiled through Direct Observation by teachers. Baseline observational data will be collected on three samples of students in classroom settings. Inter-observer agreement will be correlated for on-task behaviors as they relate to goals on the students' Behavior Rating Checklist. In support validity, student behavior checklist scores will be reviewed, and the data are expected to be in the direction with teacher-reported problem behavior and adaptive functioning issues as related to the student behavior checklist.

Validity. Multiple-baseline across participants design was used to assess the potential experimental effect of the Self-Efficacy Coaching intervention (Ledford & Gast, 2018). Classrooms were selected for participation which were functionally independent and functionally similar to establish experimental control and limit threats to validity (Ledford & Gast, 2018). Social validity will be evaluated using two measures at the conclusion of the treatment phase (Gast & Ledford). The measure assessed teacher and student satisfaction with the intervention by completing a social validity survey. The survey is on a 6-point Likert Scale, and assesses multiple areas of satisfaction with the Self-Efficacy Coaching intervention: ease of implementation, overall satisfaction with the implementation of the intervention and the likelihood that they will implement the intervention in the future (Appendix E) (Horner et al., 2005). Due to the early dismissal of school, students were unable to complete the social validity survey. The results of the teacher social validity survey are in Table 10 below.

Table 10.
Teacher responses to the Intervention Rating Profile-15.

Statement	Mean	Range
1. This would be an acceptable intervention for children's problem behavior.	4.5	(4-5)
2. Most teachers would find this intervention Appropriate for behavior problems.	4.5	(4-5)
3. This intervention should prove effective in changing children's problem behavior.	4.5	(4-5)
4. I would suggest the use of this intervention to other teachers.	4.5	(4-5)
5. The children's problem behaviors are severe enough to warrant the use of this intervention.	5	(4-6)
6. Most teachers would find this intervention suitable for the problem behaviors.	5	(4-6)
7. I would be willing to use this intervention in the classroom setting.	4.5	(3-6)
8. This intervention would not result in negative side-effects for children.	5.5	(5-6)
9. This intervention would be appropriate for a for a variety of children.	4	(3-5)
10. This intervention is consistent with those I have used in classroom settings.	3.5	(3-4)
11. The intervention was a fair way to handle children's problem behaviors.	5	(4-6)
12. This intervention is reasonable for problem behaviors.	4	(3-5)
13. I like the procedures used in this intervention	4	4
14. This intervention was a good way to handle children's problem behaviors.	4	4
15. Overall, this intervention would be beneficial to children.	4.5	(4-5)

Note. Adapted from Martens, B. & Witt, J. (1982) The Intervention Rating Profile. University of Nebraska-Lincoln.

All participating teachers completed the IRP-15 at the conclusion of the study. The positive feedback from the teachers means that this intervention was acceptable in both classrooms. Higher ratings indicate stronger agreement with the statement. The statement with the strongest agreement was "The intervention would not result in negative side effects for children," (M=5.5). The statement that showed the strongest disagreement was "This

intervention was consistent with those I have used in classroom settings." One teacher wrote an additional comment at the bottom of her survey that "It would be a good idea to have three meetings each week with a student instead of 4-5. I think that would work just as well and make it more manageable." From the teacher's meeting logs, they met with most students either 2 or 3 times each week.

Chapter IV

Results

The purpose of this study was to explore the possible impact of efforts to increase student self-efficacy and on-task behaviors for target students with ongoing disruptive behaviors while learning in mathematics. The study was implemented in two phases: (1) baseline and (2) treatment. The results of this study will be presented in this chapter, including self-reported and teacher-reported data on the dependent variables of target student on-task behaviors, achievement by target students toward grade-level goals, and teacher use of effort-ascribed feedback. Additionally, teacher consumer satisfaction ratings will be presented. The data were interpreted using a combination of visual inspection, assessment of trend data, variability, immediacy, level, and magnitude. Treatment demonstrated possible effectiveness if there was a statistically significant increase in mathematics CFA/CSA scores from Unit 4 to Unit 5, an increase in the *Strengths and Difficulties Questionnaire* positive indicators and decrease in negative indicators from pre to post, an immediate change in level for behavior from baseline to treatment, and an increasing trend in on-task behavior and teachers use of effort-ascribed feedback statements (Gast & Ledford, 2014).

Research Questions

Research question 1: self-efficacy and behavior interventions

Are there significant differences in the measured improvement of targeted student behaviors of children with disruptive behaviors based on Self-Efficacy Coaching?

Research question 2: self-efficacy and academic achievement

Are there significant differences in the improvement of targeted students mathematics achievement based on Self-Efficacy Coaching?

To answer these questions, two classroom teachers implemented Self-Efficacy Coaching in their classrooms. The classrooms were heterogeneous and included students of varying abilities, disabilities and diverse ethnic and socio-economic backgrounds.

Behavioral Change

Teacher direct observation data. A visual review of the percentage of on-task data for each of the eight target students are presented below in Fig. 5. The data for each student are separated into baseline and treatment. Immediate increases in level were observed in seven of the eight students' data upon introduction of the intervention. During treatment an accelerating trend and stability was shown for Juanita, Stoney, Chris and Shawn. Although the number of collections sessions for data do not meet the criteria of 15 of the 19 sessions and therefore did not meet implementation fidelity, since four of the eight students saw immediate increase in level which was stable throughout the treatment, there is an indication of a potential relationship between student Self-Efficacy Coaching strategies and on-task behavior during mathematics The other four students showed variability in data, and a section will follow for each student to discuss issues which may have affected outcomes.

Target student on-task. On-task data for target students are displayed in Fig. 5. The y-axis shows the percentage of on-task behavior for each target student, and the x-axis shows the session for data collection. Each students' scores are paired so that Baseline and Treatment scores are boxed for each student. The data for four of the Target students is on the first line of the Fig. 5, and data for the other four Target students is on the second line of Fig. 5. A visual review of the data for all eight students shows students increased on-task behavior during implementation of Self-Efficacy Coaching Model. On-task behavior increased the greatest for Jayshon, Juanita, Stoney, and Chris. In addition, Juanita increased and then maintained her high

level of on-task behavior through out Treatment data collection. It is important to note that sessions are not consecutive days of school since students were absent on some of the Intervention days and teachers did not collect data every day of the Intervention period. A total of nineteen Self-efficacy Coaching Interventions sessions were possible over the four-week intervention. Discussion of students' on-task behavior will follow, and it will include review of one student's data at a time.

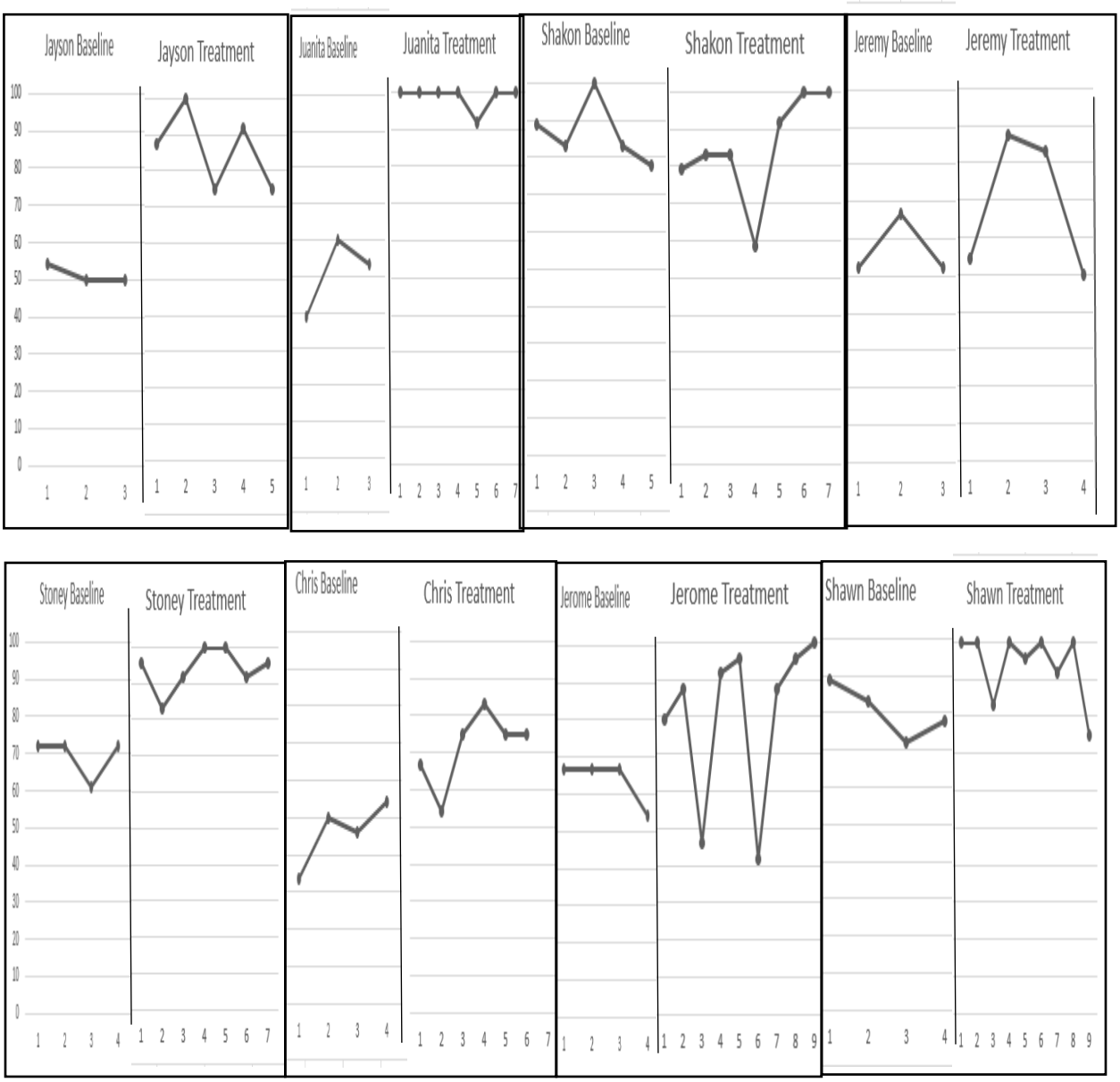

Figure 5. Percentage of target student on-task behavior.

In order to provide a clear picture of the student's access to the intervention and other potential contributing factors, discussion will include students' attendance records during the Treatment, the results of the student's initial Strengths and Difficulties Questionnaire (SDQ) and Multiple Intelligences Interest Survey, and teacher's reflections as appropriate. Students were unable to complete the post SDQ due to the natural disaster 500-year flood in the city which resulted in school being dismissed for summer for days earlier than planned, and without any warning. Results for the pre SDQ will be discussed as a component of a child's self-efficacy beliefs, overall wellness and mental health.

School attendance records were provided by the office, and they did not include the time of arrival or departure for am/pm tardies. Because of that, it was difficult to determine the extent to which the absence impacted the learning day. I created a system to consistently measure students' attendance, which includes tardies and early checkouts. Arriving late to school is considered an AM tardy; checking out of school prior to the end of the day, is considered a PM tardy. Student absences were totaled by counting the number of full-day absences and then counting two AM or PM tardies as one additional full day absence.

Jayshon. Jayshon's percentage of on-task behavior was 51% during baseline (range 50%-54%). The data showed an immediate increase in percentage of on-task behavior when the intervention was implemented from 75% to 100%, increasing by 24%. Jayshon's access to the intervention and mathematics instruction was impacted by his attendance. He had 4.5 absences during this four week period. Jayshon's data were variable during baseline and did not show stability during Treatment; however, his overall percentage of on-task behaviors was 24% higher in Treatment than baseline.

Juanita. The behavior data for Juanita showed some of the most impressive gains for the group of target students. Her percentage on-task behavior during baseline was 51% (range 39%-60%). When the intervention was implemented, her data showed a remarkable increase which was stabilized and largely maintained throughout the study. Her average percentage of on-task behavior during intervention was 100% (range of 92% to 100%). Her attendance record showed no absences or tardies during the 4-week study. In addition to the data, her teacher reported anecdotally that Juanita tried much harder than she ever had before during this study. She seemed to enjoy meeting with the teacher each time for Mentor Coaching Sessions, and she seemed eager to hear the teachers' views on her behaviors when they met. The teacher felt that the reflective meetings were a greater motivator for Juanita than the weekly rewards. Interestingly, Juanita's responses to the Multiple Intelligences Student Interest Survey, showed Intrapersonal Intelligence as her greatest strength. With that in mind, it seems logical that Juanita would thrive when given the opportunity for structured introspection as a part of her instructional day, and also the opportunity to share perspectives on her emotions, motivations and goals with her teacher. Juanita's SDQ reported as High her overall stress level, hyperactivity and concentration difficulties and behavioral difficulties.

Shakon. His teacher reported that Shakon struggled with this intervention. When he was having a good day according to Eagle Tracker, he would keep it up. However, if he observed low data in Eagle Tracker, he would "hit a slump in math," and he seemed annoyed when the timer would go off. The teacher state, "He would roll his eyes and could not handle his perceived 'failure.'" Shakon's teacher reported that he really wanted to score well, and by the end of the four-week intervention, he just wanted to do well and not have to deal with "failure." Based on the baseline and Treatment data, Shakon showed no gains in on-task behavior. His average

percentage of on-task behavior during baseline was 86.2% (range 79%-100%), and his on-task behavior during Treatment was an average of 85% (range 60%-100%). However, the average of his last four Session percentages on-task behavior was 94%, which aligns and is in the same direction as would be expected based on the observations of his teacher. Shakon's attendance was good during the four-week intervention, with no absences or tardies. The results of his SDQ showed his overall stress as Very High, and also High for behavioral difficulties and difficulties getting along with other children.

Jeremy. This student had the fewest data sessions recorded of all the students participating in the study: only 4 out of 19 sessions. This was largely due to discipline issues. Although he was still physically at school, he was removed from the classroom during 2.5 out of the 19 sessions, and he had an additional 5.5 days out of the classroom for Out-of-School Suspension. In addition, he had one additional absence from school during this four-week period, for a total of 9 days absent. Despite this, Jeremy's behavior data showed improvement. During baseline, his average percentage of on-task behavior was 56.7% (range 51%-68%). This improved to 67.75% on-task behavior during Treatment (range 50%-89%). Jeremy's data were also impacted by the presence of a Special Education teacher who pushed into math class intermittently in order to provide him with IEP (Individual Education Plan) services. Her presence in class on certain days resulted in higher on-task percentages. Jeremy's teacher reported that his ongoing struggles with depression, violence and persistently negative thinking kept him from actively engaging in the Intervention. She said that he sees himself as stupid and feels that he will always be stupid. Therefore, he is not interested in learning. Despite this, his teacher felt that Jeremy came to have a positive attitude after the reflection meetings, and his

score was much better the following day. Jeremy did not complete a *Strengths and Difficulties Questionnaire* or the Multiple Intelligences Student Interest Survey.

Stoney. Stoney's data are different from the others due to the fact that he did not have a single Mentor Coaching Session during the entire four-week study. His teacher reported that this was due to scheduling issues since he attended math class in her room, but his homeroom was actually the other teacher. Consequently, neither teacher was ever able to schedule Mentor Coaching Sessions with him. Although he did not participate in Coaching, his behavior scores still showed impressive results. His baseline percentage of on-task behavior was 68.25% (range 60%-71%), and his seven Session scores during Treatment had an average of 93% on-task behaviors (range 81%-100%). Despite his not participating in Mentor Coaching Sessions, his data change level immediately, and it stabilized for the remainder of the intervention.

Chris. The demographic information for Chris may shed light on some challenges to his school career. Chris has changed schools 8 times since Kindergarten. He was also retained in Kindergarten, so he is older than most of his peers. Chris's behavior percentage on-task behavior data showed marked improvements from baseline to Treatment. Baseline average percentage on-task behavior was 46.25% (range 53%-67%), and his Treatment on-task average percentage was 71.5% (range 54%-83%). Chris's attendance may have impacted his results with the study. He had 3 absences during the course of the study. Craig's teacher reported anecdotally that participation in this study seemed to benefit him. The teacher conferencing with him and her words seemed to be what mattered most to him. The reward was not necessary for his participation. The teacher also reported that this student has ADHD (attention-deficit-hyperactivity disorder), which requires medication. However, his parent frequently forgets to refill his prescription. Chris is aware of his change in behavior when he is off his medication, and

he makes concerted efforts to control it. His teacher observed that Chris became much more focused when he knew that his behavior was being tracked. She also noticed that he conducted himself much better than he ever has before because he knew the reflection meeting was coming. Chris' strengths on the Multiple Intelligences Interest Survey were Interpersonal Intelligence and Logical-Mathematical Intelligence, which may help explain the positive response he had to this Mentor Coaching model, which focused on mathematics. Chris data showed an immediate change in level, and it stabilized for the remainder of the intervention.

Jerome. Jerome's behavior data showed strong gains of 27.3% percentage of on-task behavior from baseline to Treatment. His average percentage of on-task behavior during baseline was 63.5% (range 53%-67%). During the Treatment, his average percentage of on-task behavior increased to 80.8% (range 42%-100%). Jerome scored High on the *SDQ* in the areas of hyperactivity and concentration difficulties and difficulties getting along with other children. Jerome's school attendance is good, with the exception of a few tardies.

Shawn. Shawn's demographic information shows that he has changed schools six times since Kindergarten. In addition, his SDQ shows as Very High his overall stress, hyperactivity and concentration difficulties, and difficulties getting along with other children. He showed gains in percentage of on-task behaviors during Treatment. His average was 80.5% during baseline (range 71%-89%), and it increased to an average of 94% (range 75%-100%) during Treatment. His data showed an immediate change in level and then stabilized for the remainder of the intervention.

Strengths and Difficulties Questionnaire. The Strengths and Difficulties Questionnaire (SDQ) was read aloud to all student-participants to correct for any potential reading challenges which could impact results. SDQ data are situational, and it is common for the data to change

over time (Goodman, 2001). As previously stated, it was planned that students would complete SDQ prior to intervention and again after the conclusion. However, the early dismissal of school prohibited that from occurring.

Although some of the individual results were shared in the earlier sections discussing student's behavior data, I will share here some aggregate data from the SDQ. One target student did not complete the questionnaire. Forty-three percent of students participating in the study scored High or Very High in the category of overall stress. Since this study focuses on addressing disruptive classroom behavior, it is not surprising that 57% of the participants scored High or Very High for hyperactivity, concentration difficulties and difficulties getting along with other children. All students reported Average or Slightly Raised emotional distress. It is interesting to note that there were not any students who scored above average on strength category of kind and helpful behaviors; in fact, three scored Average on kind and helpful behaviors, two were Slightly Low, and two Very Low. As a measure of mental health and overall well-being, our participants demonstrated areas of concern which potentially could have show improvement from participation in interventions like this study or other school-based interventions. Those areas of concern were overall stress, behavioral difficulties, and difficulties getting along with others.

Although the protocol for this study included using the SDQ as a pre and post Treatment measure, as previously stated, students were unable to complete the post-assessment due to school dismissing early.

Office referrals. Office referrals were intended to be one of the multiple measures of behavior in this study. In some schools, this data will provide baseline against which decreases in the levels of disruptive behavior can be measured. However, the "floor effect" impacted the

potential to use this data as a measure of behavior because the number of office referrals were minimum, and profound activity would have been difficult to overcome. For example, only one of the eight target students had any office referrals at all. Therefore, Office Referrals in this study do not provide useful data to measure reductions in disruptive classroom behavior or serve as a multiple measure of behavior.

Multiple intelligences student interest survey. The purpose of this measure was primarily to assist with developing the Reinforcement Menu. However, some interesting trends emerged from this data. Students had strengths in many different Intelligences, with one exception. All students participating in this study except for one showed Interpersonal Intelligence as a strength. Interpersonal intelligence is the ability to understand and interact effectively with others (Thomas, nd). This involves both verbal and nonverbal communication, sensitivity to the moods and emotions of others, the ability to entertain multiple perspectives, and the ability to note distinctions among others.

Learners with Interpersonal Intelligence thrive on social interactions, and they work well collaboratively (Gardner & Hatch, 1989). Characteristics of this Intelligence which may be helpful in the elementary classroom, include empathetic, enjoys teaching others, and enjoys social events (Gardner & Hatch, 1989). There was a social aspect to the Self-efficacy Coaching Model in the daily Mentor Coaching meetings with the teacher. Teacher feedback indicated that for several of the study participants, the meetings with the teachers were more important to the participants than the weekly rewards as a motivation to complete the self-reflection. That may be due to the overwhelming majority of participants reporting Interpersonal Intelligence as a strength.

Teachers can use this information to design classroom structures which allow this strength to shine. That could include peer tutoring, class jobs such as Event Planner or Queen/King of Celebrations, and lesson designs that frequently provide the option for student collaboration and interaction with others. As teachers develop classroom management strategies to reduce disruptive behaviors or other issues, it is best practice to start from a student's strengths in building a plan which will work that individual. Strengths in Interpersonal Intelligence will help students to collaborate well with others at future jobs and to be a team player, which are two of the "soft skills" for college and workplace readiness (Rose & Betts, 2001).

Summary. The visual inspection of target student on-task data assessed the potential for pre-experimental effect of the Self-efficacy Coaching Strategies on the behavior of students indicated by teachers as highly disruptive behaviors. For four of the eight students, an immediate change in level were observed when the intervention was introduced. During treatment, on-task behavior for the same four students stabilized and remained consistently high, at or approaching 100%. Variability in the data were observed for four of the eight target students, but despite that, seven of the four students showed an increase in level of on-task behavior, potentially indicating a functional relationship.

Mathematical Change

Research Question 2 explored the impact of Self-efficacy Coaching Model on student mathematics achievement. Data collection included Common Formative Assessment (CFA) data for Units 4 and 5, and Common Summative Assessment (CSA) data for Units 4 and 5. Independent *t*-Tests were chosen for answering the research question because Research Question 2 relates one dependent variable (mathematics achievement) and one independent variable (Self-Efficacy Mentor Coaching strategies) (Creswell, 2003; Tabachnick & Fidell, 2007.) The

hypotheses will be tested using Independent T-Tests, using the student scores pre and post tests on the Common Formative Assessments (CFA). (see Figs. 6-13 below). Results will be presented using descriptive statistics for measured variables including the means, standard deviations, frequencies, percentages, and in text and in tables, as appropriate. All hypotheses will be tested at a statistical significance threshold of $p < .05$.

Common formative assessments. Mathematics assessment in the two participating classrooms Common Formative Assessments (CFA) which teachers collaborate to develop as part of their work as a Professional Learning Community. The CFAs are administered throughout a unit, and the CFAs assess a different Learning Target at each assessment. Unit 4 was completed prior to the Intervention, and Unit 5 was completed during the Intervention. In this section, the data from Unit 4 will be compared to the data from Unit 5 for each of the target students. The Learning Targets for Units 4 and 5 are similar in focus, and they measure the important mathematical area of Number Sense in a grade-appropriate context of fractions. Learning Targets are written in student-friendly language, and they are in the form of "I can…" statements. Learning Targets (LT) for each unit are listed in Table 11 (Burdick & Hall, 2019).

Table 11
Learning targets.

	Unit 4	Unit 5
Learning Target 1:	I can recognize equivalent fractions.	I can compare and decompose with unit fractions and fractions.
Learning Target 2:	I can generate equivalent fractions.	I can add and subtract unit fractions and fractions.
Learning Target 3:	I can find the simplest form of a fraction.	I can convert between improper fractions and mixed numbers.
Learning Target 4:	I can identify common denominators to compare fractions with unlike denominators.	I can add and subtract mixed numbers.
Learning Target 5:	I can compare fractions using symbols.	I can multiply a whole number by a unit fraction or fraction.
Learning Target 6:	I can use benchmark fractions as a way to justify my fraction comparisons	I can multiply a whole number by a fractions.

Each LT is assessed on a scale equivalent to ACT Aspire. Points are awarded for each LT assessment, and those are categorized as Advanced, Proficient, Close and In Need of Support. The LT in Unit 4 and Unit 5 are similar, making the comparison of these two a practical measure of mathematical growth. In each of the Figs. below, the y axis is percentage earned of points possible, and the x axis is Learning Targets 1 – 6. Unit 4 assessments are blue, and Unit 5 assessments are orange. The LTs are worth different numbers of points, which are assigned by the teachers. In order to make comparison's possible across all LTs, each target student's LT score has been converted to a percentage of points possible. For example, in Fig. 6 below, Unit 4 LT 1 is worth 5 points, and Jayshon scored 3 points on the assessment. 3 divided by 5 equals 0.60 x 100 equals 60 percent. The percentages are recorded in Tables 12 and 13 below.

You will note that in Fig. 6 below, there is a blank space where the assessment for Unit 4 LT 5 should be. Blank spaces in any of Figs. 6 through 13, are reporting that the student did not take the assessment, or that he took it, and scored zero points. You can locate the data in Table 12 or 13 in order to determine which case it is. A brief discussion of each target student's scores will follow each Fig.

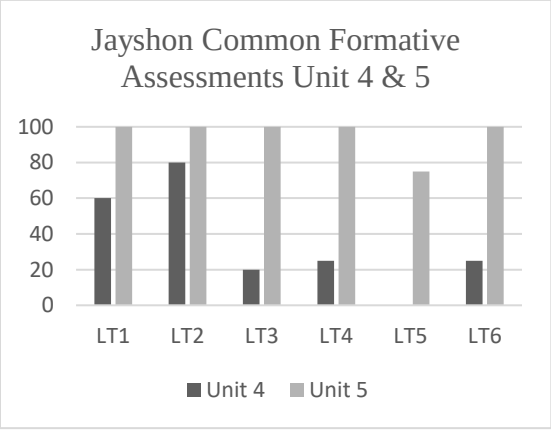

Figure 6. Jayshon's percentage of points earned for Units 4 & 5 CFA.

Jayshon's CFA results. In Figure 6 above, Jayshon's scores for each LT in Unit 5 improved dramatically from his scores in Unit 4. On Unit 5, he received perfect scores on LT1. 2, 3, 4, and 6.

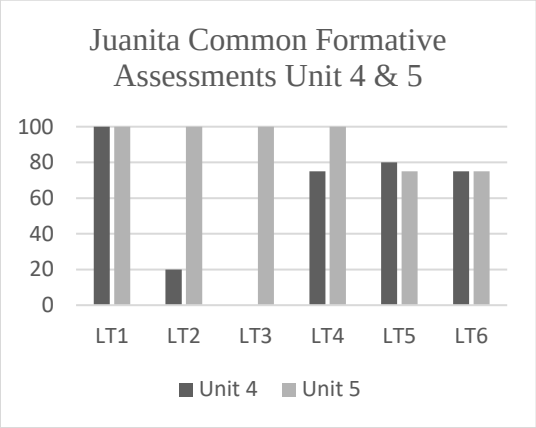

Figure 7. Juanita's percentage of points earned for Units 4 & 5 CFA.

Juanita's CFA results. Juanita's scores (Figure 7 above) for Unit 4 compared to Unit 5 show that she performed much better from Unit 4 to 5 on LTs 2, 3, and 4, but either the same or slightly worse on LTs 1, 5, and 6. Her score on Unit 4 LT 3 was zero points. She had only one perfect score in Unit 4, but she had four perfect scores in Unit 5.

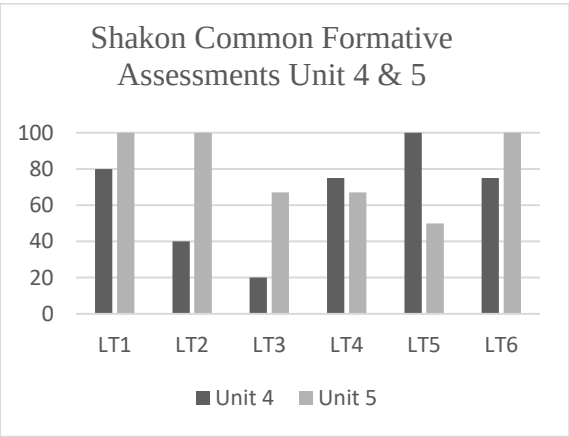

Figure 8. Shakon's percentage of points earned for Units 4 & 5 CFA.

Shakons's CFA results. Figure 8 above shows that Shakon improved his scores from Unit 4 to Unit 5 on four of the LTs, and two of those were improved around 50 percentage

points. He had only one perfect score for Unit 4, but he had three for Unit 5.

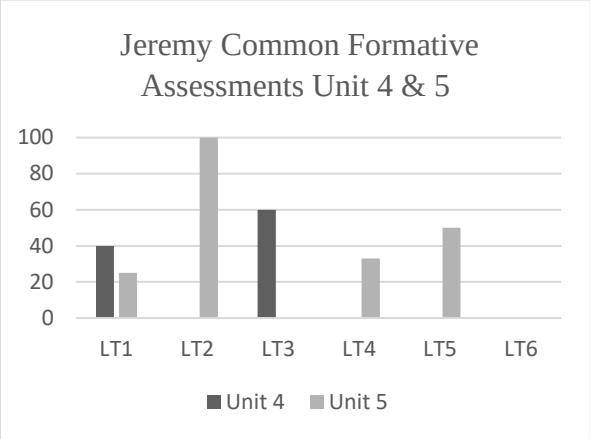

Figure 9. Jeremy's percentage of points earned for Units 4 & 5 CFA.

Jeremy's CFA results. Jeremy had three scores of zero on Unit 4 LTs 2, 5, and 6, and also a zero for Unit 5, LT 3, as seen in Figure 9 above. He did not take the assessment for Unit 4, LT 4, or Unit 5 LT 6. An increase in scores on LTs 2 & 5. He went from scoring zero points to a perfect score on LT 2 and increased by 50% his score on LT 5.

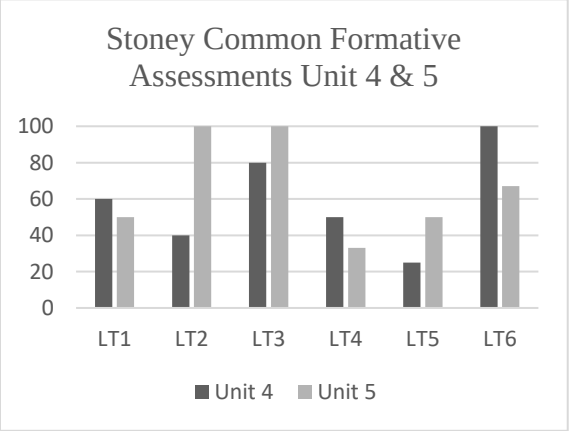

Figure 10. Stoney's percentage of points earned for Units 4 & 5 CFA.

Stoney's CFA results. In Figure 10 above, Stoney improved his scores on three of the six LTs from Unit 4 to Unit 5 assessments. In addition, he only earned one perfect score for LT 6 in Unit 4, but he earned two perfect scores on LTs 2 and 3 in Unit 5.

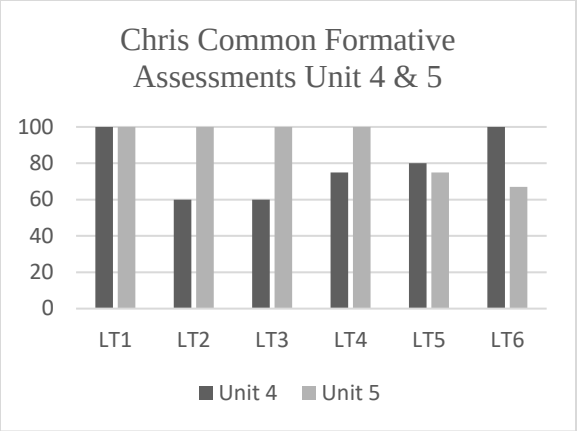

Figure 11. Chris's percentage of points earned for Units 4 & 5 CFA.

Chris's CFA results. Chris CFA results show that his scores improved or remained the same on 5 of the 6 LTs see Figure 11. In addition, he improved from two perfect scores for Unit 4 to four perfect scores for Unit 5.

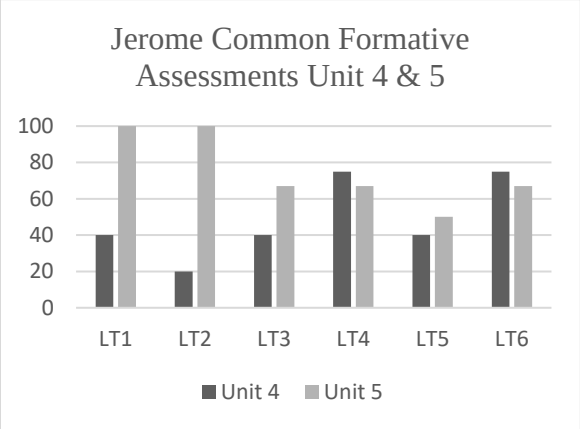

Figure 12. Jerome's percentage of points earned for Units 4 & 5 CFA.

Jerome's CFA results. Jerome improved his CFA scores on four of the six LT, as seen in Fig. 12 above. His scores slight decrease in score on LT 4 and 6 was related to the number of points possible; 3 points were possible on those two assessments, compared to 4 on the other questions. Mathematically, the only percentages possible out of 3 points are 100%, 67%, 33% or 0. Consequently, the "change" in score was due to the calculation procedure and not necessarily

to a decrease in mathematical proficiency. In addition, he earned perfect scores on two LTs for Unit 5. He had not earned any perfect scores on Unit 4.

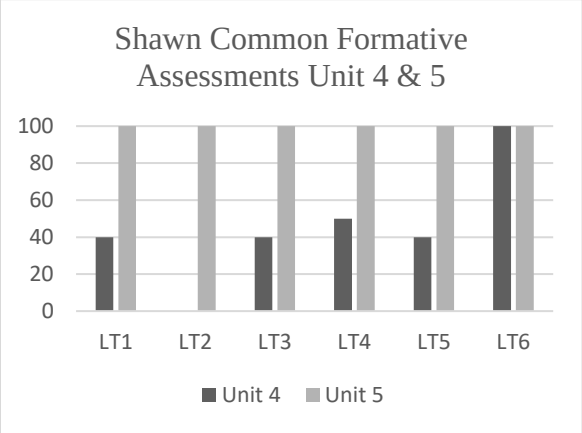

Figure 13. Shawn's percentage of points earned for Units 4 & 5 CFA.

Shawn's CFA results. In Fig.13 above, Shawn drastically improved his scores on 5 of the 6 LTs, and he made a perfect score on every LT in Unit 5. He increased the percentage of points that he earned from 45% in Unit 4 to 100% in Unit 5. He is the only target student to earn a perfect score on every Common Formative Assessment in a unit.

The data in Tables 12 and 13 below compares the same CFA data for all eight target students. Table 12 are students' percentage of points earned for Unit 4 Common Formative Assessments, and Table 13 is students' percentage for Unit 5 CFAs. Percentage of points earned was calculated due to varying points possible on Learning Target assessments.

Table 12
CFA unit 4: percentage of points earned by learning target.

Student	LT1	LT2	LT3	LT4	LT5	LT6	Percent of Points
Jayshon	60%	80%	20%	25%	0	25%	35%
Juanita	100%	20%	0	75%	80%	75%	58%
Shakon	80%	40%	20%	75%	100%	75%	65%
Jeremy	40%	0	60%	Did not attempt	0	0	20%
Stoney	60%	40%	80%	50%	100%	100%	72%
Chris	100%	60%	60%	75%	80%	100%	79%
Jerome	40%	20%	40%	75%	40%	75%	48%
Shawn	40%	0	40%	50%	40%	100%	45%
Target Average	65%	33%	40%	61%	55%	69%	
Class Average	68%	53%	50%	66%	75%	73%	

The target student average and class average in Table 12 on unit 4 above reflect that the target group scored below the class average for all six Learning Targets in Unit 4. In Table 13 on unit 5 (below), that is not the case. The average of the target students was actually above the class average for two of the six Learning Targets.

Table 13
CFA unit 5: percentage of points earned by learning target.

Student	LT1	LT2	LT3	LT4	LT5	LT6	Percent of Points
Jayshon	100%	100%	100%	100%	75%	100%	96%
Juanita	100%	100%	100%	100%	75%	100%	96%
Shakon	100%	100%	67%	67%	50%	100%	81%
Jeremy	25%	100%	0	33%	50%	Did not attempt	42%
Stoney	50%	100%	100%	33%	50%	67%	67%
Chris	100%	100%	100%	100%	75%	67%	90%
Jerome	100%	100%	67%	67%	50%	67%	75%
Shawn	100%	100%	100%	100%	100%	100%	100%
Target Average	84%	100%	79%	75%	66%	86%	
Class Average	92%	99%	86%	87%	82%	63%	

Comparing Unit 4 to Unit 5. A simple comparison of each target student's results from Unit 4 to Unit 5 indicate that, overall, target students increased their scores from pre-intervention assessments (Unit 4) to during-intervention assessments (Unit 5). However, statistical analysis is necessary to determine if the positive difference reached the threshold for significance. An independent samples T-test was conducted to compare target students' scores for Learning Targets in Unit 4 to Unit 5. A two-tailed T-test was conducted, with significance at the $p<.05$ level. There was a significant difference in the scores for target students for LTs in Unit 4 ($M=52.75$, $SD=19.67$) to Unit 5 ($M=80.00$, $SD=21.49$); $t(14)= -2.64597$, $p=.019179$ Table 14 below. Cohen's effect size ($d = 1.32$), suggested high practical significance. These results suggest that Self-Efficacy Coaching may have a positive effect on the mathematics achievement of students with Emotional Behavioral Disorder. Specifically, the results may suggest that when teacher efforts are made to increase students' levels of self-efficacy for mathematics, the

students' mathematics achievement increases. Further research is needed to determine whether the combined focus on student self-reflection and mentor-coaching meetings is necessary, or if the extra attention students received during the coaching sessions is what made the difference. Due to school ending early, the Common Summative Assessment (CSA) for Unit 5 was not given, and no data were collected for that measure during the intervention.

Table 14
Target students' CFA & CSA before & during the intervention.

	Pre-Intervention			During Intervention		
	n	M	SD	n	M	SD
Assessments						
CFA	8	52.75	19.97	8	80	21.49
CSA	8	52.50	25.19	0	Did not attempt	

Further statistical data were necessary because a review of the scores showed that the whole class also increased their scores from pre-intervention (Unit 4) to during intervention (Unit 5) Independent samples T-test was conducted to compare the scores for the entire class for Learning Targets in Unit 4 to Unit 5. A two-tailed T-test was conducted, with significance at the $p<.05$ level. There was a significant difference in the scores for the entire class for LTs in Unit 4 (M=64.17, SD=10.38) to Unit 5 (M=84.83, SD=12.19); t(14)= -3.16, p=.010127; see Table 15 below. These results suggest that the classroom instruction in Unit 5 does have a positive effect on the mathematics achievement of the whole class. Specifically, the results suggest that mathematics instruction for Unit 5 as implemented in these 4th grade classrooms, increased the class' mathematics achievement.

Table 15
Whole class CFA before & during the intervention.

	Pre-Intervention			During Intervention		
	n	M	SD	n	M	SD
Assessments						
CFA	6	64.17	10.38	6	84.83	12.19

Comparing target students to the whole class. Next I compared the six Learning Target (LT) scores on the Common Formative Assessments (CFAs) for the target students and the whole class. An independent-samples T-test was conducted to compare target students' scores for Learning Targets in Unit 4 to scores of the whole class for Unit 4. A two-tailed T-test was conducted, with significance at the $p<.05$ level. There was no significant difference in the scores for target students for LTs in Unit 4 (M=52.75, SD=19.97) to and the whole class (M=64.17, SD=10.38); t(61)= -1.42765, p=.183868. An independent-samples T-test was also conducted to compare the target students to the whole class for Unit 5, two-tailed and with significance at $p<.05$. There was no significant difference in the scores for target students for LTs in Unit 5 (M=81.67, SD=11.47) to and the whole class (M=84.83, SD=12.19); t(62)= -0.46353, p=.652913. These results suggest that Self-Efficacy Coaching does not have a significant effect on the mathematics achievement of students with Emotional Behavioral Disorder. Specifically, the results suggest that when teacher efforts are made to increase target students' levels of self-efficacy for mathematics, the students' mathematics achievement increases but not at a level significantly different from the class as a whole class (Table 16 below).

Table 16
Target students' & whole class CFA before & during the intervention.

	Target Students			Whole Class		
	n	M	SD	n	M	SD
Assessments						
Unit 4 CFA	8	52.75	19.97	55	64.17	10.38
Unit 5 CFA	8	81.57	11.47	56	84.83	12.19

Finally, the trend data for Common Formative Assessments throughout the year were collected. Based on the trends displayed below in Figs. 14-21, it is clear that 7 of the 8 students' performance on CFAs during Treatment exceeded projections based on CFA trend data. Of those students, five exceeded the trend data by greater than 20 percentage points, and two exceeded it

by fewer than 20 percentage points. Conversely, Stoney's performance on CFAs during Treatment was below projection based on trends.

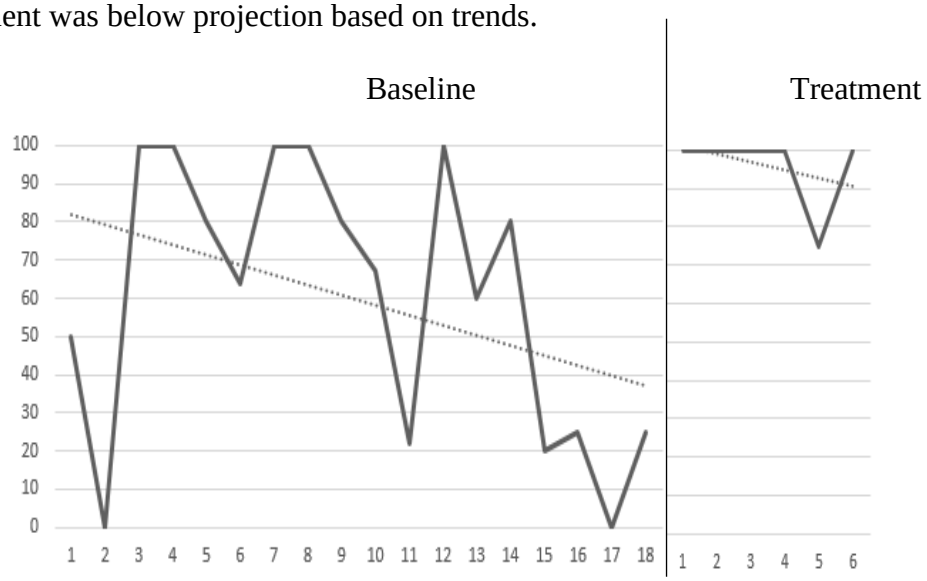

Figure 14. Jayshon CFA data before and during intervention.

Figure 14 shows Jayshon's mathematics Common Formative Assessments (CFA) data during baseline and treatment. The 18 data points collected before intervention Treatment reflect 18 student assessment scores and the percentage of points possible that were earned for each assessment. Those are marked on the horizontal axis, with assessments 1-18 completed prior to the Treatment during baseline, along with the final 6 assessments of the year completed during the intervention. The percentage earned of points possible is on the vertical axis with a range of 0-100%. For example, assessment 1 was worth 4 points, and Jayshon earned 2 out of 4 points. In order to compare assessments which with different points possible for each assessment, I divided the number of points earned by the student by the number of points possible, and then multiplied by 100 to get a percent. In the previous example, two divided by 4, multiple by 100 is 50. Fifty is the percentage of points Jayshon earned for assessment 1, and that is reflected in Fig. 14 above.

The trend of data during Jayshon's baseline shows a decline in assessment scores from the beginning of the year until Treatment began at the end of April (range 40-80). The trend line

predicts that Jayshon will earn between 40% and 25% of points possible for the final six assessments. It is clear in Fig. 14 above, that the Jayshon's data for the final six assessments, do not follow that trend. The trend data for Jayshon's final six mathematics assessments for the year exceed what would be been expected based on the trend data (range 90-100).

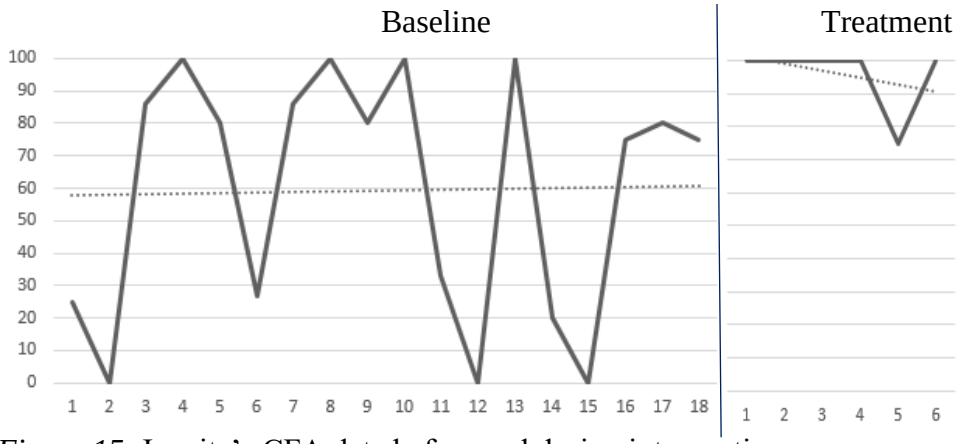

Figure 15. Juanita's CFA data before and during intervention.

Figure 15 shows Juanita's baseline and treatment data. The percentages were calculated in the method described in the paragraphs above. Juanita's baseline trend data reflect stability near 60% of points earned, despite her scores on individual assessments varying greatly from one assessment to another (range 0-100). During Treatment, her scores increased and became more stable across all six assessments (range 90-100). Treatment data greatly exceeds what would have been expected based on trend data from baseline.

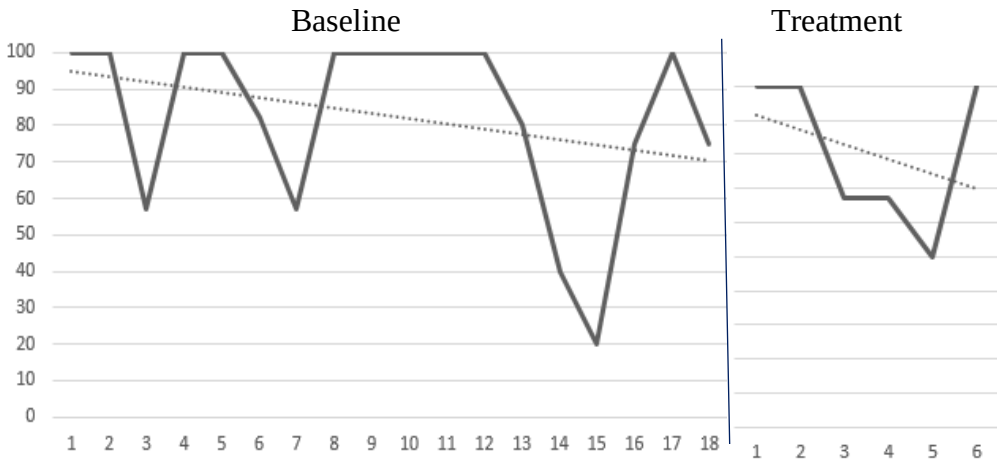

Figure 16. Shakor's CFA data before and during intervention.

Fig. 16 shows Shakor's baseline and treatment data. Shakor's data of percentage of points earned for each of the six final assessments reflect an initial change in level at the onset of the Treatment intervention, and then steadily decreases to scores based on baseline trend data.

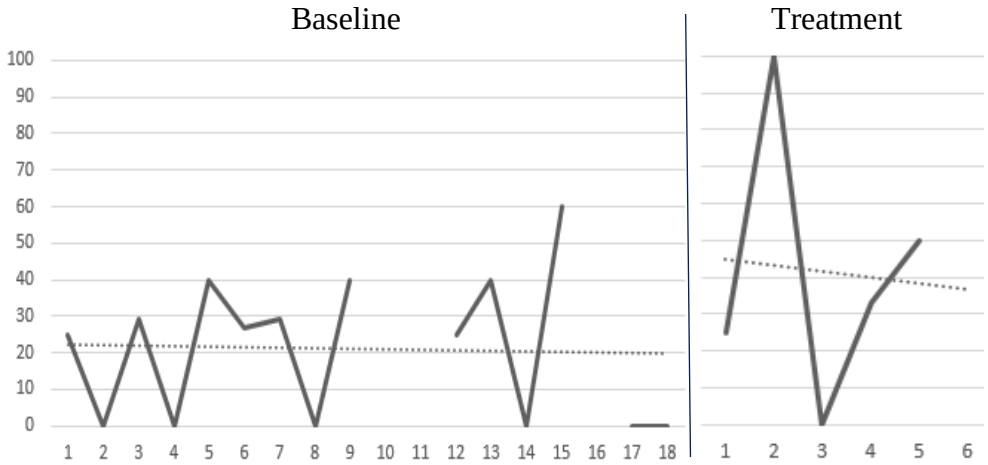

Figure 17. Jeremy's CFA data before and during intervention.

Fig. 17 shows Jeremy's baseline and treatment data. His baseline data reflects a stable trend with Jeremy earning around 20% of points possible on the 18 assessments during baseline. During Treatment, his scores increased above what would have been expected based on trend data, with Jeremy earning around 40% of points possible on the final 6 assessments.

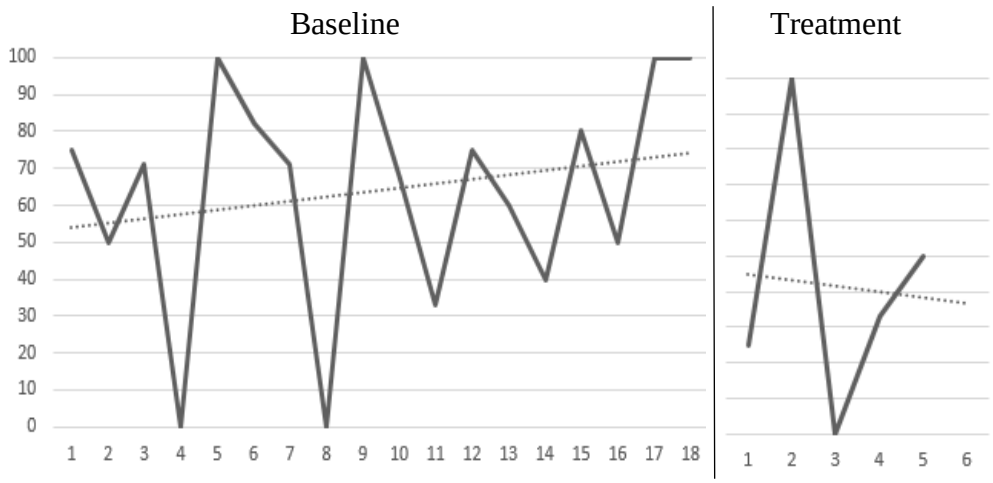

Figure 18. Stoney's CFA data before and during intervention.

Fig. 18 shows Stoney's baseline and treatment data. Stoney is the only Target student whose data reflect an immediate decrease in mathematics achievement at the onset of the Treatment intervention. In fact, Stoney's trend data during baseline shows a steady increase, and based on that trend, the percentage of points earned for the last 6 assessments would have been expected to fall between 70-80%. Instead, Stoney's percentage of points earned, showed a decrease, with the trend for the final 6 assessments continuing to decrease from a trend line in the mid 40s (range 0-100). As you may recall, Stoney is the only student who had one teacher for homeroom, but attended mathematics class in the other classroom. He is also the only student who had no Mentor Coaching sessions with an adult.

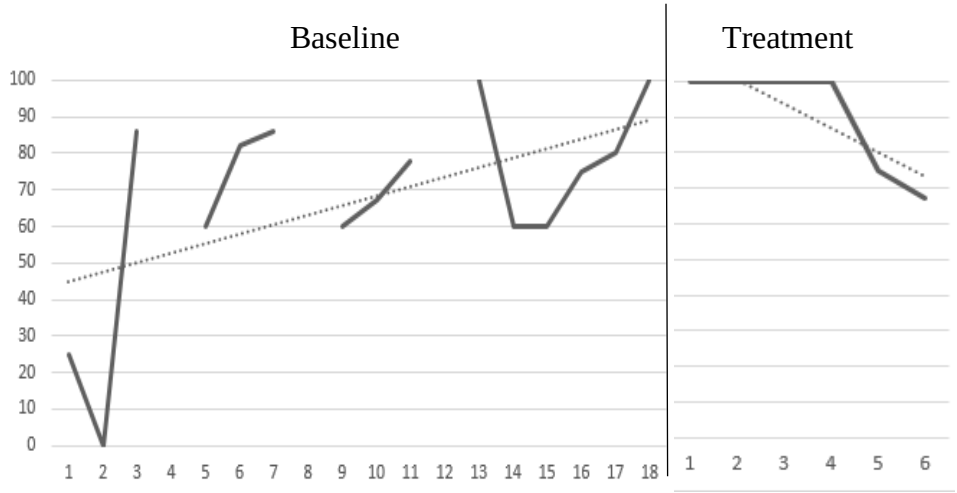

Figure 19. Chris's CFA data before and during intervention.

Figure 19 shows Chris' baseline and treatment data. The gaps in Chris' data are due to Chris not completing several of the assessments during baseline. Overall, his data show an increasing trend during baseline, which would have predicted scores in the 90s during the final 6 assessments of the year. However, although Chris showed an immediate increase on the first 4 of the 6 final assessments, his percentage of points earned on the final two assessments of the year scored were in the pre-intervention range (65-75).

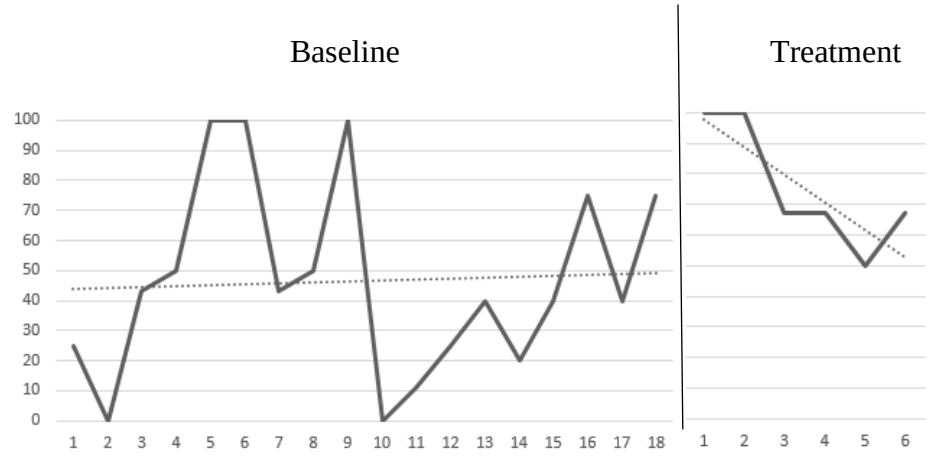

Figure 20. Jerome's CFA data before and during intervention.

Fig. 20 shows Jerome's baseline and treatment data. The trend line during baseline data collection reflects that Jerome earned around 50% of points possible on the first 18 assessments of the school year (range 0-100). Jerome's data during Treatment showed a large immediate increase on the first two of the final 6 assessments, but the overall the scores reflect a decreasing trend. By the final assessment of the year, Jerome's scores were back to what would have been predicted based on the baseline trend.

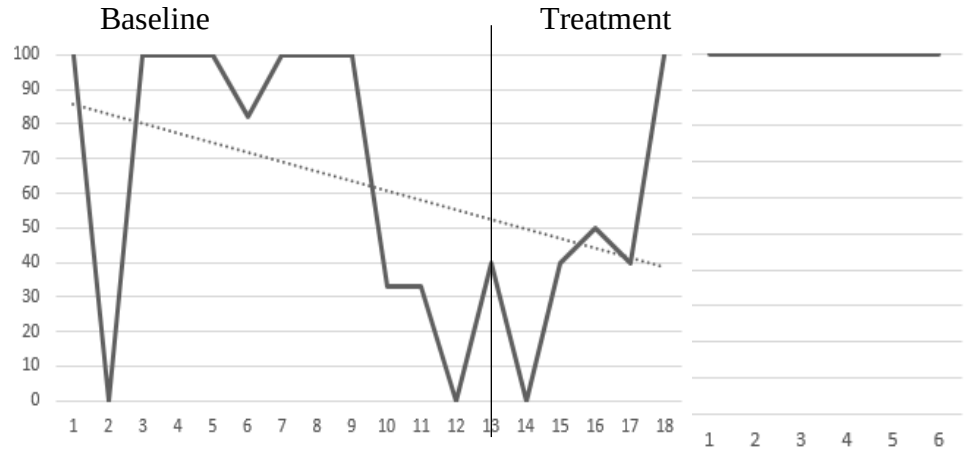

Figure 21. Shawn's CFA data before and during intervention.

Fig. 21 shows Shawn's baseline and treatment data. Shawn's data on the first 18 assessments of the year shows a decreasing trend, and in fact, reflects half (9) of his scores showing that he earned either 0 or 100% of points possible. During Treatment, Shawn's percentage of points earned on the mathematics assessment was 100%.

Common Summative Assessments. Finally, I compared the Common Summative Assessment data for the 6 Learning Targets (LT) for target students compared to the whole class (Table 17 below). Target students scored well below the class average on all 6 LTs.

Table 17.
CSA Unit 4: percentage of points earned by learning target

Student	LT1	LT2	LT3	LT4	LT5	LT6	Average
Jayshon	75%	100%	0	100%	0	25%	50%
Juanita	50%	25%	0	25%	80%	25%	33%
Shakon	50%	75%	50%	25%	80%	25%	51%
Jeremy	50%	0	25%	0	0	25%	17%
Stoney	Did not attempt	Did not attempt	Did not attempt	Did not attempt	Did not attempt	Did not attempt	Did not attempt
Chris	50%	50%	50%	100%	80%	100%	72%
Jerome	50%	25%	25%	0	40%	100%	40%
Shawn	50%	75%	50%	0	40%	50%	44%
Target Average	54%	50%	29%	36%	46%	50%	
Class Average	73%	60%	46%	52%	77%	86%	

Independent-samples T-test were conducted to compare target students' CSA scores for LTs in Unit 4 to scores of the whole class for Unit 4. A two-tailed T-test was conducted, with significance at the $p<.05$ level. There were significant difference in the scores for target students in Unit 4 (M=44.17, SD=9.60) and the whole class (M=65.57, SD=15.50); t(61)= -2.88496, p=.016247. Cohen's effect size (d = 1.32), suggested high practical significance. Hedge's effect size (d = 1.43), suggested high practical significance (Table 18 below).

Table 18.
Target students' & whole class CSA before & during the intervention.

	Target Students			Whole Class		
	n	M	SD	n	M	SD
Assessments						
Unit 4 CSA	7	44.17	9.60	56	65.67	15.50
Unit 5 CSA	0	Did not attempt		0	Did not attempt	

There are no data reported for Common Summative Assessment for Unit 5 because the students were unable to complete it due to school dismissing early.

Summary. Target students' MAP GROWTH scores were intended to be used as one of the multiple measures of mathematics achievement. However, due to school dismissing early, the target students were unable to complete the May 2019 administration of the assessment, and consequently, no MAP GROWTH data are available after the conclusion of the intervention. Therefore, MAP GROWTH will not be used as a measure of mathematics achievement, other than as a screening tool to select target students and an indication of overall mathematics achievement this year, including mastery of Number Sense.

Mathematics achievement as defined for this study meant increased achievement if students increased the percentage of points earned on CFAs. All students except one (Stoney) showed gains in mathematics achievement by increasing the percentage of points earned on CFAs during the Treatment. Jayshon, Juanita and Shawn showed the greatest increases in

mathematics achievement. Shawn's scores during the Treatment stand out because he earned 100% of points possible on all 6 of the assessments during Treatment. In addition, Juanita showed the most impressive gains in mathematics achievement, and she earned 96% of the points possible in Unit 5 CFA, compared to 58% in Unit 4 CFA. Stoney's mathematics scores were the only ones to actually decrease during the Treatment intervention. He earned 72% of points possible in Unit 4 CFA, and he only earned 67% of points possible for Unit 5 CFA. Stoney was the only Target student who did not participate in Mentor Coaching sessions. Additionally, his homeroom teacher and his teacher for mathematics were different, and he was the only Target student to be assigned to both 4th grade teachers during the school day. This may have impacted his access to the interventions in this study.

Teacher Feedback. Teacher effort-ascribed feedback was counted prior to the beginning and at the conclusion of the Intervention using a frequency count. This included whole-class feedback, feedback given to groups, and also feedback given to individual students. The data were collected by the researcher during Direct Observation sessions in the classroom. The researcher conducted three observation sessions prior to the beginning of the intervention during mathematics instruction for a period of 50-80 minutes each time in order to establish a baseline. The baseline data are in Table 19 below. Neither teacher had a single instance of effort-ascribed feedback during the three baseline observation sessions. Due to school being dismissed early, the researcher was unable to collect data after the conclusion of the intervention. This data were being collected as an indication of transferability and sustainability of the intervention. Since no post-intervention data were collected, no conclusions can be drawn.

Table 19.
Teacher use of effort-ascribed feedback.

Observation	#1	#2	#3	#4	#5	#6
Burnett	0	0	0	Not observed	Not observed	Not observed
Hill	0	0	0	Not observed	Not observed	Not observed

Chapter V

Discussion

Introduction

The purpose of this study was to investigate multi-component mathematics and behavior interventions targeting student self-efficacy for on-task behavior in the general education classroom for elementary students with Emotional Behavioral Disorder (EBD). The impact on the frequency of effort-ascribed feedback from teachers was also evaluated. This chapter will discuss the results of the study. First, the research questions are presented with data collected to summarize the findings. Second, implications for practice are discussed. Next, limitations to this research are presented. Finally, considerations for future studies and a summary of the significance of the outcomes are discussed.

Research Questions

Research question 1: self-efficacy and behavior interventions

Are there significant differences in the measured improvement of targeted students' on-task behaviors of children with disruptive behaviors after Self-Efficacy coaching?

Baseline data of on-task behavior of target students were collected in two classrooms. On-task data were also collected during the 4-week intervention Treatment phase throughout the four weeks of the study. The data are presented in Figures 7 through 13. Visual inspection of the on-task data showed an immediate increase in level of on-task behavior, indicating potential experimental effect. Seven of the 8 students showed increased on-task percentages over the four weeks of the study, potentially indicating a relationship. Four of the 8 showed immediate large increases in on-task behavior, which stabilized and were consistent throughout the remainder of the study. Self-efficacy Coaching Mentor meetings were measured using a frequency count. For

the purpose of intervention fidelity, 15 of the 19 sessions were needed. None of the Mentor Coaching logs met the standard of 15 meetings with students (M=6.75). Teachers reported anecdotally the remarkable improvement in on-task behavior of 5 of the 8 target students, using phrases such as, “better than she ever had before,” “he was really trying to get that 3,” and “coaching sessions and time with me mattered to him more than reward.” Teachers also reported a marked improvement in the behavior of the class as a whole when the intervention began. Teachers felt that the timer alarm every 10 minutes was a factor increasing class-wide on-task behavior. Teachers also decided spontaneously to award their classes “compliment points” if the entire class was on-task when the timer sounded. This addition created an informal contingency-model, which research has shown to be effective at improving student behavior (Denune, Hawkins, Donovan, Mccoy, Hall, & Moeder, 2015).

Research question 2: self-efficacy and student mathematics achievement

Are there significant differences in the measured improvement of targeted students’ mathematics achievement of children with disruptive behaviors after Self-Efficacy coaching?

Collected baseline MAPS GROWTH data showed that 7 of the 8 target students were low growth and low achievement in mathematics as measured by RIT. In addition, one student was high growth, low achievement. The Common Formative Assessments showed significant growth for 7 of the 8 target students from Unit 4 (Pre-Intervention) to Unit 5 (Post-Intervention), and the trend data for all five mathematics units also showed increased achievement for 7 of the 8 target students. This may indicate that the Self-Efficacy coaching strategies have a positive impact on the mathematics achievement of target students with Emotional Behavioral Disorder (EBD). However, the whole class also showed significant growth from Unit 4 to Unit 5.

Further comparisons were made between the means of target students and the whole class. Although the statistical data for these comparisons showed no significance, a review of trend data makes clear that target students increased their mathematical achievement during the intervention, which may indicate a potential relationship between Self-efficacy Coaching strategies and mathematics achievement. However, it is necessary to repeat the intervention using a control-group in order to explore the possibility of a functional relationship. The target students also increased the number of Learning Targets for which they made a perfect score. In addition as further evidence of mathematics achievement, the mean scores of target students were all below the class means for Learning Targets (LT) in Unit 4. That was not true for Unit 5, in which two of the mean scores for target students were higher than the class means for those LTs.

Implications

Carter et al., (2011), found that self-management strategies including self-monitoring, self-reinforcement, and self-evaluation can be readily taught to and easily acquired by the students. The results of this study are consistent with previous findings evaluating self-efficacy related to behavior. Self-management skills learned in these interventions could be readily used in multiple settings with a possible improvement to academic outcomes as well as socio-behavioral outcomes (Carter, et al., 2011). Self-efficacy Coaching offers for teachers a readily available and effective resource for supporting positive learning behavior. This study extends the literature by demonstrating a possible pre-experimental effect for on-task behavior and mathematics achievement for elementary students with Emotional Behavioral Disorder (EBD). Using a multi-component approach to focus on mathematics and behavior broadens support in the general education classrooms for students with EBD. Limited literature has assessed the

impact of self-efficacy in the elementary classrooms as studies evaluating these practices has been primarily at the secondary or college level.

Although all students demonstrated disruptive behaviors, only one of the eight Target students, Jeremy, was identified with Emotional Behavioral Disorder (EBD) qualifying for an Individual Education Plan (IEP) under IDEA (IDEA, 2004.) This may be partially due to the challenge of identification and testing with the frequent moves of half of the study participants. In addition, schools have the ongoing challenge of gathering sufficient data to support an EBD diagnosis (Landrum, et al., 2003). During this study, Jeremy increased his rate of on-task behavior (56.7% to 67.75%), and he also increased his mathematics achievement (20% to 42%). However, despite these increases, his on-task behavior and mathematics achievement remained some of the lowest of all Target students. Slower response to intervention and the need for additional support are hallmarks of EBD (Landrum, et al., 2003). The findings of this study reiterate what EBD researchers and classroom teachers have observed: The most under-served population (EBD) is also the group that needs the most support for an intervention to succeed (Landrum, et al., 2003; Lane, et al., 2008).

There are other important implications, as well. Although there were no data collection to support the impact of effort-ascribed feedback due to the early dismissal of school, the teachers reported that they implemented effort-ascribed feedback in their classrooms, and they felt that it had a positive impact with both the target students and the whole class. The anecdotal reports from teachers of the strong positive response of several of the students to the Self-Efficacy Coaching Mentor sessions, reiterates the importance of the relationships and the first rule of educators: They don’t care what you know until they know that you care (Mendler & Mendler, 2012; Mendler, 2000; Otten & Tuttle, 2011). The findings of this study are impacted by the

positive relationships and rapport the teachers have with their students. Wanting to please someone is an excellent motivator. Conversely, having to discuss poor choices is an accountability system that works in many areas, including weight loss and for classroom management. Another important implication is consumer satisfaction with the intervention. Teachers showed high satisfaction with the intervention. Consumer satisfaction has been linked to sustained implementation, and high ratings from teachers suggest that the teachers may continue to implement the intervention after the study concludes.

There is another important implication of these findings. The potential for pre-experimental effect should encourage practitioners to experiment with this theory in their own classrooms. Although statistical significance and a control group are needed to make this a researched best-practice in the long run, promising practices such as this can provide options for educators who need fresh ideas for addressing disruptive behaviors while research is being done to provide statistical validation.

Recommendations for future research. Self-efficacy Coaching strategies were utilized with EBD students and improved on-task behavior was recorded in diverse elementary classrooms. Targeted student's mathematics achievement improved. Further research needs to be done with an experimental design and control group to determine whether there is a causal relationship. Future studies should implement the Self-Efficacy Coaching model for an extended Treatment period of 8-12 weeks using a control group to provide more data from which to draw conclusions. In addition, the study should be replicated and address limitations in this study. Such studies should evaluate the validity of the findings in this study, increase levels of training and support to promote teacher fidelity of implementation, and evaluate the impact of the intervention on mathematics achievement. Researchers should evaluate the impact of Self-

Efficacy Coaching with students from diverse ethnic backgrounds. In addition, further research should provide a follow-up observations four to six weeks after the conclusion of the Treatment in order to evaluate potential long term impact on students and teachers.

Replication of this study should also be planned to include a control group and larger target population in order to increase the likelihood of including a more diverse group of participants. Ultimately, replication studies will need to be conducted with a larger sample size to establish an empirical base for its effectiveness in improving outcomes for students with EBD. In addition, replication should be considered for varied student groups, including a) students whose behavior is a function of work avoidance, b) students who struggle in mathematics, but whose behavior is not disruptive, and c) students who could benefit from the flexibility of this intervention in a variety of school settings, including small group instruction in the classroom and pull out intervention groups.

Recommendations for practice. The results of this study demonstrate two potentially important practices for teachers working with EBD or students at risk for EBD. First, implementing interventions with a combined focus on mathematics and behavior has the potential to support the development of a holistic intervention approach for improving on-task behavior in the context of mathematics instruction, instead of focusing on academics and behavior interventions separately (Harris, Oakes, Lane & Rutherford, 2009; Lane & Menzies,2003; Lane, O'Shaughnessy, Lambros, Gresham & Beebe-Frankenberger, 2001; Nelson, Martella & Marchand-Martella, 2002). Second, the potential of self-efficacy coaching as a promising practice may support educators by providing an additional classroom resource as they are collecting data in conjunction with Response to Intervention or the special education

assessment process related to identification of potential Emotional Behavioral Disorder under IDEA.

This type of approach targets content-specific behaviors in the context of Common Core State Standards (2011), a type of mathematics instruction which students tend to find interesting and engaging. Research has found that students with EBD typically receive low-quality mathematics instruction which focuses on basic skills and limited active engagement (Jackson & Neel, 2006). The promising results of this study emphasizes that using curriculum such as Extending Children Mathematically provides inherent engagement, exploration and problem solving. This should encourage special education teachers and general education teachers to increase the rigor of lessons as a behavior management strategy by using real-world problem-solving situations, by encouraging students to verbalize their thinking and model using manipulatives, and through opportunities for students to explore mathematical theories without first receiving direct instruction.

Limitations

Although the results of this study are promising, there are several limitations to the research. First, there was no control group. Second, since the focus population was students with Emotional Behavioral Disorder who also function below grade level in mathematics, a larger sample size was difficult to obtain. Third, this study focused on a small sample of 4th grade students and this narrow focus may results may limit the generalizability to other school and classroom environments. For example, secondary schools targeting disruptive behaviors may be impacted by changing class schedules and different teachers throughout the day. Fourth, the timing of this study significantly impacted teacher and student focus. The end of the school year is a busy time for field trips, field days and special programs. Although they may be educational

in nature, the continued disruption within the school day impacted the rate of data collection, interrupted math instructional time and fragmented the students' experiences with the intervention. Further, research should consider multiple measures for mathematics achievement and increasing the frequency of teacher fidelity checks in order to improve the fidelity of implementation.

Conclusion

Limited research exists on high-quality mathematics instruction for students with EBD. Prior to this study, research measuring outcomes for both behavior and mathematics for elementary students were minimal. This study extends the literature discussion and provides a promising classroom practice for addressing disruptive behavior in the general education classroom for students with EBD. To explore further, an inclusion classroom could provide a rich environment for this intervention to be further researched, while also providing the support of two adults to meet the students' needs.

Self-efficacy for mathematics shows promise as a practice which makes a positive difference in on-task behavior and mathematics achievement of students with EBD. This study explores the mathematical achievement of EBD students who are participating in multi-component interventions addressing mathematics content and self-regulation, and it provides a foundation for future studies. Improved outcomes for mathematics is a national goal, and elementary children can benefit from national focus on mathematics for developing screeners, targeted interventions and progress monitoring, which are all important components of the Response to Intervention (RTI) system. Students with EBD are in urgent need of targeted RTI resources as an underserved population. Continued research is necessary to measure and define

the construct of self-efficacy for mathematics for elementary students with EBD and to provide additional resources for teachers.

References

Anderson, J., Kutash, K., & Duchnowski, A. (2001). A comparison of the academic progress of students with EBD and sudents with LD. *Journal of Emotional and Behavioral Disorders*, *9*(2), 106-115.

Arkansas Department of Education. (2017). Interpretive guide for ACT aspire summative reports. Retrieved online from arkansased.org.

Ashton, P. T, & Webb, R. B. (1986). *Making a difference: Teachers' sense of efficacy and student achievement.* New York: Longman.

Balfanz, R., Herzog, L., & Mac Iver, D. (2007). Preventing student disengagement and keeping students on the graduation path in urban middle-grades schools: Early identification and effective interventions. *Educational Psychologist, 42*(4), 223–235.

Bandura. A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191-215.

Bandura, A. (1984). Recycling misconceptions of perceived self-efficacy. *Cognitive Therapy and Research, 8,* 231-255.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28,* 117-148.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Barkley, R.A., Anastopoulos, A.D., Guevremont, D.C. & Fletcher, K.E. (1992). Adolescents with attention deficit hyperactivity disorder: Mother-adolescent interactions, family beliefs and conflicts, and maternal psychopathy. *Journal of Abnormal Child Psychology, 20*(3), 263-288.

Barkley, R. A. (2014). *Attention-deficit hyperactivity disorder: a handbook for diagnosis and treatment* (3rd ed.).

Barkley, R. A., Grodzinsky, G., & DuPaul, G. J. (1992). Frontal lobe functions in attention deficit disorder with and without hyperactivity: A review and research report. *Journal of Abnormal Child Psychology, 20,* 163–188.

Barling, J. & Abel, M. (1983). Self-efficacy beliefs and tennis performance. *Cognitive Therapy and Research, 7*(3), 265-272.

Baroody, K. (2011). Turning around the nation's lowest-performing schools: Five steps districts can take to improve their chances of success. *Center for American Progress*. Retrieved online at https://www.americanprogress.org/issues/education-k 12/reports/2011/02/04/9035/turning-around-the-nations-lowest-performing-schools/.

Bierman, K.L., Nix, R.L., Greenberg, M.T. et al., (2008). Executive functions and school readiness intervention: Impact, moderation, and mediation in the Head Start REDI program. *Development and Psychopathology, 20*, 821-43.

Bernacki, M.L., Nokes-Malach, T.J., & Aleven, V. (2015). Examining self-efficacy during learning: variability and relations to behavior, performance, and learning. *Metacognition and Learning*, *10*(1), 99-117.

Blood, E., Johnson, J. W., Ridenour, L., Simmons, K., & Crouch, S. (2011). Using an iPod Touch to teach social and self-management skills to an elementary student with emotional/behavioral disorders. *Education and Treatment of Children, 34*(3).

Bedrova, E. & Leong, D.J. (2007). *Tools of the Mind. The Vygotsky approach to early childhood education*, 2nd ed.. Upper Saddle River, NJ: Pearson Merrill/Prentice Hall.

Boynton, M. & Boynton, C. (2005). *The educator's guide to preventing and solving discipline problems.* Alexandria, VA: Association for Supervision and Curriculum Development.

Braden, S., & Smith, D. (2006). Managing the college classroom: Perspectives from an introvert and an extrovert. *College Quarterly*. *9*(1): 1-9. Retrieved from http://www.collegequarterly.ca.

Bradley, R., Dolittle, J., & Bartolotta, R. (2008). Building on the data and adding to the discussion: The experiences and outcomes of students with EBD. *Journal of Behavioral Education, 17*, 4-23.

Bradshaw, C., Reinke, W., Brown, L., Bevans, K., & Leaf, P. (2008). Implementation of school-wide positive behavioral interventions and supports (PBIS) in elementary schools. Observations from a randomized trial. *Education and Treatment of Children, 31*, 1-26.

Bryant, D. P., Kim, S. A., Hartman, P., & Bryant, B. (2006). Standards-based mathematics instruction and teaching middle school students with mathematical disabilities. In M. Montague, & A. K. Jitendra (Eds.), *Teaching mathematics to middle school students with learning difficulties* (pp. 7–28). New York, NY: Guilford

Bullis, M. & Yovanoff, P. (2006). Idle hands: Community employment experiences of formerly incarcerated youth. *Journal of Emotional and Behavioral Disorders, 14*(3), 71-85.

Bursch, B., Tsao, J.C., Meldrum, M. & Zelter, L.K. (2006). Preliminary validation of self-efficacy for child functioning despite chronic pain (child and parent versions). *Pain, 125*(1-2), 35-42.

Bus, A. G., & van IJzendoorn, M. H. (1999). Phonological awareness and early reading: A meta-analysis of experimental training studies. *Journal of Educational Psychology, 91*(3), 403-414.

Canter, L. & Canter, M. (1992). *Assertive discipline: Positive management for today's classroom.* Seal Beach, CA: Canter and Associates.

Canter, L. (2006). *Classroom management for academic success*. Bloomington, IN: Solution Tree.

Canter, L. (2009). *Assertive discipline: Positive behavior management for today's classrooms,* 4th ed. Bloomington, IN: Solution Tree Press.

Caplin, D., Austin, J.K., Dunn, D.W., Shen, J., & Perkins, S. (2002). Development of a self-efficacy scale for children and adolescents with epilepsy. *Children's Health Care, 31*, 295-309.

Carter E. W., Lane L. K., Crnobori, M., Bruhn A. L., & Oakes P. W. (2011). Self-determination interventions for students with and risk for emotional and behavioral disorders: Mapping the knowledge base. *Behavioral Disorders, 36*(2), 100-116.

Center on Developing Child at Harvard University. (2017). *Executive function & self-regulation*. Retrieved from http://developingchild.harvard.edu

Chelune, G. J., Fergusson, W., Koon, R., & Dickey, T. O. (1986). Frontal lobe disinhibition in attention deficit disorder. *Child Psychiatry and Human Development, 16,* 221–234.

Cheny, D., Stage, S., Hawkens, L., Lynass, L., Mielenz, C., & Waugh, M. (2009). A 2-year outcome study of the check, connect, and expect intervention for students at risk for severe behavior problems. *Journal of emotional and behavioral disorders*, 17(4), 226-243.

Cleary, T.J., Velardi, B., & Schnaidman, B. (2017). Effects of the self-regulation empowerment program (SREP) on middle school students' strategic skills, self-efficacy, and mathematics achievement. *Journal of School Psychology, 64,* 28-42.

Colvin, G. (2004). *Managing the cycle of acting-out behavior in the classroom.* Eugene, OR: Behavior Associates.

Colavecchio, S. & Miller, K. (2002). Bad kids in class: How unruly students have changed the way today's teachers teach. *The Palm Beach Post*, Section A.

Common Core State Standards Initiative. (2010). *Common core state standards for mathematics (CCSSM).* Washington, DC: National Governors Association Center for Best Practices and the Council of Chief State School Officers. Retrieved from http://www.corestandards.org/wp-content/uploads/Math_Standards.pdf.

Cosier, M., & Ashby, C. (Eds.). (2016). *Enacting change from within: Disability studies meets teaching and teacher.* New York, NY: Peter Lang.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches (2nd ed.).* Thousand Oaks, CA: Sage.

Crozier, S. & Tincani, M. (2007). Effects of social stories on prosocial behavior of preschool children with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 37*, 1803-1814.

Cullen, K.W., Baranowski, T., & Smith, S.P. (2001). Using goal setting as a strategy for dietary behavior change. *Journal of the American Dietetic Association, 101*,562-566.

Davis, L., Saunders,J,.Johnson, S., MiUcr-Cribbs.J., Williams,T, & Wexler, S, (2O03). Predicting positive academic intentions among African American males and females. *Journal of Applied Social Psychology, 33*, 2306-2326.

Davis, F. W., & Yates, B. T. (1982). Self-efficacy expectancies versus outcome expectancies as determinants of performance deficits and depressive affect. *Cognitive Therapy and Research, 6*(1), 23-35.

Deci, E., Hodge, R., Pierson, L., & Tomassone, J. (1992) Autonomy and competence as motivational factors in students with learning disabilities and emotional handicaps. *Journal of Learning Disabilities*, *25*(7), 457-471.

Denune, H., Hawkins, R., Donovan, L., Mccoy, D., Hall, L., & Moeder, A. (2015). Combining self-monitoring and an interdependent group contingency to improve the behavior of sixth graders with EBD. *Psychology in the Schools, 52*(6), 562-577.

DuFour, R., DuFour, R, Eaker, R. & Many, T. (2010). *Learning by doing: A handbook for professional learning communities at work.* Bloomington, IN: Solution Tree Press.

Dunlap, G., Clarke, S., Jackson, M., Ramos, E., & Brinson, S. (1995). Self-monitoring of classroom behaviors with students exhibiting emotional and behavioral challenges. *School Psychology Quarterly, 10*, 165-177.

DuPaul, G.J. & Stoner, G.D. (2003). *ADHD in the schools: assessment and intervention strategies* (2nd ed.). New York: Guilford Press.

Dweck, C.S. (2006). *Mindset: The new psychology of success.* New York, NY: Random House.

Eklund, J., Loeb, C, Hansen, E.M., & Andersson-Wallin, A.C. (2012). Who cares about others? Empattic self-efficacy as an antecedent to prosocial behavior. *Current Research in Social Psychology, 20*(3), 31-41.

Erikson, E. (1959/1980). *Identity and the life cycle.* New York: Norton.

Eslinger, P. J. (1996). *Attention, memory, and executive function*. Baltimore: Brooks.

Etheridge, T. (2010). *Assertive discipline and its impact on disruptive behavior* (Doctoral Dissertation). Retrieved from Pro-Quest Dissertations & Theses database. (Publication No. AAT 3409180).

Fertman, C.I. & Primack, B.A. (2010). *Elementary student self-efficacy scale development and validation focused on student learning, peer relations, and resisting drug use.* Doi: 10.2190/DE.39.1.b.

Gable, R. A., Tonelson, S. W., Sheth, M., Wilson, C., & Park, K. L. (2012). Importance, usage, and preparedness to implement evidence-based practices for students with emotional disabilities: A comparison of knowledge and skills of special education and general education Teachers. Education and Treatment of Children, *35*(4), 499-520.

Garcia, M. E., Schmitz, J. M., & Doerfler, L. A. (1990). A fine-grained analysis of the role of self-efficacy in self-initiated attempts to quit smoking. *Journal of Consulting and Clinical Psychology, 58,* 317-322.

Gardner, H. & Hatch, T. (1989). Multiple intelligences go to school: Educational implications of the theory of multiple intelligences. Educational Researcher, *18*(8), 4-9.

Gast, D. L., & Ledford, J. R. (Eds.). (2014). *Single case research methodology: Applications in special education and behavioral sciences (2nd ed.).* New York, NY, US: Routledge/Taylor & Francis Group.

Geary, D. (2011). Consequences, characteristics, and causes of mathematical learning disabilities and persistent low achievement in mathematics. *Journal of Developmental & Behavioral Pediatrics*, *32*(3), 250-263.

Geary, D.C. (2004). Mathematics and learning disabilities. *Journal of Learning Disabilities, 37,* 4-15.

Geary, D. C., Hamson, C. O., & Hoard, M. K. (2000). Numerical and arithmetical cognition: A longitudinal study of process and concept deficits in children with learning disability. *Journal of Experimental Child Psychology, 77,* 236–263.

Gelman, R. & Butterworth, B. (2005). Number and language: how are they related?. *Trends in Cognitive Sciences, 9*(1), 6-10.

Gersten, R., Jordan, N.C., & Flojo, J.R. (2005). Early identification and interventions for students with mathematics difficulties. *Journal Learning Disabilities*, *38*(4), 293-304.

Gnagey, W. (1983). Changing the Attitudes of High School Inhibitors: A Schoolwide Intervention Strategy. *The Clearing House, 56*(6), 278-280. Retrieved from http://0-www.jstor.org.library.uark.edu/stable/30180954.

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*(11): 1337-1345.

Gray, C.A. (2000). *The new social story book: illustrated edn.* Arlington, TX: Future Horizons.

Greenbaum, P.E., Dedrick, R.F., Friedman, R.M., Kutash, K., Brown, E.C., Lardieri, S.P., & Pugh, A.M. (1996). National Adolescent and Child Treatment Study (NACTS): Outcomes for children with serious emotional and behavioral disturbance. *Journal of Emotional and Behavioral Disorders, 4*(3), 130-146.

Grodzinsky, G. M., & Barkley, R. A. (1999). Predictive power of frontal lobe tests in the diagnosis of attention deficit hyperactivity disorder. *Clinical Neuropsychologist, 13*, 12–21.

Gulchak, D. J. (2008). Using a mobile handheld computer to teach a student with an emotional and behavioral disorder to self-monitor attention. *Education and Treatment of Children, 31*(4), 567-581.

Hadley, J. Mowbray, T., & Jacobs, N. (2017). Examining the mediating effect of self-efficacy on approval of aggression and proactive aggression. *Journal of School Violence, 16*(1) 86-103.

Hallahan, D.P, & Kauffman, J.M. (2000). *Exceptional learners: Introduction to special education* (8th ed.). Boston: Allyn and Bacon.

Harris, P., Oakes, W., Lane, K.L., & Rutherford, R.B. (2009). Improving the early literacy skills of students at risk for internalizing or externalizing behaviors with limited reading skills. *Behavioral Disorders, 34*(2), 72-90.

Hawken, L.S., Adolphson, S.L., Macleod, K.S. & Schumann, J. (2009). Secondary-tier interventions and supports. In W. Sailor, G. Dunlap, G. Sugai, & R.H. Horner (Eds.). *Handbook of positive behavior support* (pp. 395-420). New York, NY:Springer.

Harrison, J., Bunford, N. Evans, S. & Owens, J. (2013). Educational accommodations for students with behavioral challenges: a systematic review of the literature. *Review of Educational Research: Online First.* 10.3102/0034654313497517. Retrieved 12/22/2018.

Horner, R.H., Carr, E.G., Halle, J., McGee, G., Odom, S. & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children, 71*(2), 165-179.

Horner, R., Sugai, G., Smolkowski, K., Todd, A., Nakasato, J., & Esperanza, J. (2009). A randomized control trial of school-wide positive behavior support in elementary schools. *Journal of Positive Behavior Interventions, 11*(3), 113-144.

Hughes, C. and Dunn, J. (2002). When I say a naughty word: longitudinal study of young children's accounts of anger in themselves and close others. *British Journal of Developmental Psychology, 20*(4), 515-35.

Jackson, H. & Neel, R. (2006). Observing mathematics: Do students with EBD have access to standards-based mathematics instruction? *Education and Treatment of Children, 29*(4), 593-614.

Jenson, W.R., Rhode, G., Morgan, D., & Evans, C. (2013). *The tough kid principal's briefcase: Practical behavior management for the whole school,* 2nd edn. Eugene, OR: Pacific Northwest Publishing.

Jerusalem, M., & Mittag, W. (1995). Self-efficacy in stressful life transitions. In A. Bandura (Ed.), *Self-efficacy in changing societies.* (pp. 177-201). New York, NY: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511527692.008.

Joet, G., Usher, E., & Bressoux, P. (2011). Sources of self-efficacy: An investigation of elementary school students in France. *Journal of Educational Psychology, 103*(3), 649-663.

Jolivette, K., Wehby, J.H., Canale, J. & Massey, N.G. (2001). Effects of choice-making opportunities on the behavior of students with emotional and behavioral disorders. *Behavioral Disorders, 26*(2).

Johns, B., & Carr, V. (2012). *Reduction of school violence: Alternatives to suspension.* Palm Beach Gardens, FL: LRP.

Jordan, C., Logel, C., Spencer, S., Zanna, M., & Whitfield, M. (2009). *The heterogeneity of self-esteem: Exploring the interplay between implicit and explicit self-esteem.* 10.4324/9780203809884.

Jordan, C., Spencer, S., Zanna, M., Hoshino-Browne, E., & Correll, J. (2003). Secure and defensive high self-esteem. *Journal of Personality and Social Psychology, 85*(5), 969.

Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004)

Individuals with Disabilities Education Improvement Act, P.L. 108-446 (2004)

Kern, L., Hilt-Panahon, A., & Sokol, N. (2009). Further examining the triangle tip: Improving support for students with emotional and behavioral needs. *Psychology in the Schools, 46*, 18-32.

Kern, L, & Clemens, N. H. (2007). Antecedent Strategies to Promote Appropriate Classroom Behavior. *Psychology in the Schools*, *44*, 65-75.

Kerr, M., & Nelson, C. (2010). *Strategies for Addressing Behavior Problems in the classroom* (2nd edn). New Jersey: Pearson Education.

Khanehkeshi, A. & Ahmedi, F.A. (2013). Comparison of self-efficacy and self-regulation between students with school refusal behavior (SRB and the students without (SRB), and

the relationships of these variables to academic performance. *Journal on Educational Psychology, 6*(3), 9-16.

Landrum, T. J., Tankersley, M., & Kauffman, J. M. (2003). What is special about special education for students with emotional or behavioral disorders? *The Journal of Special Education, 7*(3), 148-156.

Lane, K., Barton-Arwood, S. & Wehby, J. (2008). Academic performance of students with emotional and behavioral disorders served in a self-contained setting. *Journal of Behavioral Education, 17*(1), 43-62.

Lane, K. L,, & Menzies, H. M. (2002). Promoting achievement and minimizing risk—phase I: The impact of a school-based primary intervention program. *Preventing School Failure, 47*, 26-32.

Lane, K., Wehby, J., Little, M., & Cooley, C. (2005). Students educated in self-contained classrooms and self-contained schools: Part II—how do they progress over time? *Behavioral Disorders, 30*(4), 363-374.

Lane, K. L., Rogers, L. A., Parks, R. J., Weisenbach, J. L., Mau, A. C., Merwin, M. T., & Bergman, W. A. (2007). Function-based interventions for students who are nonresponsive to primary and secondary prevention efforts: Illustrations at the elementary and middle school levels. *Journal of Emotional and Behavioral Disorders, 3*, 169–184.

Lane, K. L., & Beebe-Frankenberger, M. (2004). *School-based interventions: The tools you need to succeed.* Boston: Pearson Education.

Lane, K. L,, & Wehby, J. (2002). Addressing antisocial hehavior in the schools: A call for action. *Academic Exchange Quarterly, 6*, 4-9.

Lane, J., & Lane, A. (2001). Self-efficacy and academic performance. *Social Behavior and Personality: An international journal, 29*, 687-694.

Lane, K. L., O'Shaughnessy, T. E., Lambros, K. M., Gresham, F. M., & Beebe-Frankenberger, M. E. (2001). The efficacy of phonological awareness training with first-grade students who have behavior problems and reading difficulties. *Journal of Emotional and Behavioral Disorders, 9*(4), 219-231.

Lee, J. (2012). College for all: Gaps between desirable and actual P–12 math achievement trajectories for college readiness. *Educational Researcher, 41*(2), 43-55.

Ledford, J. & Gast,D. (2018). *Single case research methodology: applications in special education and behavioral sciences.* New York, NY: Routledge.

Lent, R. & Hackett, G. (1987). Career self-efficacy: Empirical status and future directions. *Journal of Vocational Behavior, 30*(3) 347-382.

Lewis, T. & Sugai, G. (1999). Effective behavior support: A systems approach to proactive schoolwide management. *Focus on Exceptional Children, 31*(6), 1-24.

Lezak, M. D. (1993). *Neuropsychological assessment*. New York: Oxford.

Locke, E.A., & Latham, G.P. (2002). Building a practically useful theory of goal setting and task motivation: a 35-year odyssey. *American Psychologist*, *57*, 705-717.

Loftin, R.L., Gibb, A.C., & Skiba, R. (2005). Using self-monitoring strategies to address behavior and academic issues. Impact, 18(2), 12-13. Retrieved from the Web site of the Institute on Community Integration, University of Minnesota (http://ici.umn.edu.)

Maccini, P. & Gagnon, J. (2002). Perceptions and applications of NCTM standards by special and general education teachers. *Exceptional Children, 78*(2), 217-234.

Malloy, P. F., Cohen, R. A., & Jenkins, M. A. (1998). Frontal lobe function and dysfunction. In P. J. Snyder & P. D. Nussbaum (Eds.), *Clinical neuropsychology: A pocket handbook for assessment* (pp. 573-590). Washington, DC, US: American Psychological Association.

Malofeeva, E., Day, J., Saco, X., Young, L. & Ciancio, D. (2004). Construction and evaluation of a number sense test with head start children. *Journal of Educational Psychology, 96*(4).

Manning, M. M., & Wright, T. L. (1983). Self-efficacy expectancies, outcome expectancies, and the persistence of pain control in childbirth. *Journal of Personality and Social Psychology, 45*(2), 421-431.

Marks, D. J., Berwid, O. G., Santra, A., Kera, E. C., Cyrulnik, S. E., & Halperin, J. M. (2005). Neuropsychological correlates of ADHD symptoms in preschoolers. *Neuropsychology, 19*(4), 446-455. doi:10.1037/0894-4105.19.4.446

Marlatt, G. A., Baer, J. S., & Quigley, L. A. (1995). Self-efficacy and addictive behavior. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 289-315). New York, NY, US: Cambridge University Press.

Martens, B. & Witt, J. (1982). *The Intervention Rating Profile.* Lincoln, NB: University of Nebraska-Lincoln.

Martino, A.M., & Maher, C.A. (1999). Teacher questioning to promote justification and generalization in mathematics: What research practice has taught us. *Journal of Mathematical Behavior, 18*(1), 53-78.

Marzano, R. J. (2003). *What works in school: Translating research into action*. Alexandria, VA. Association for Supervision and Curriculum Development.

Marzano, R. J., Marzano, J. S., & Pickering, D. (2003). *Classroom management that works: research-based strategies for every teacher*. Alexandria, VA: Association for Supervision and Curriculum Development.

McGinnis, E., & Forness, S. (1988). Psychiatric diagnosis: A further test of the special education eligibility hypothesis. *Severe Behavior Disorders Monograph, 11*, 3-10.

Minter, A. & Pritzker, S. (2015). Measuring adolescent social and academic self-efficacy: Cross –ethnic validity of the SEQ-C. *Research on Social Work Practice*, *27*(7).

Moe, K. O., & Zeiss, A. M. (1982). Measuring self-efficacy expectations for social skills: A methodological inquiry. *Cognitive Therapy and Research, 6*(2), 191-205.

Montague, M. & Jitendra, A. (2006). *Teaching mathematics to middle school students with learning difficulties.* New York, NW: The Guilford Press.

Morgan, D. (2014). Pragmatism as a paradigm for social research. *Qualitative Inquiry*, *20*(8), 1045–1053.

Morris, K. (2015). *Promoting positive behavior in the early years*. Maidenhead, Berkshire: McGraw-Hill Education.

Multi-Tiered Systems of Supports. (nd). Retrieved online at http://florida-rti.org/educatorResources/MTSS_Book_ImplComp_012612.pdf

National Association of State Directors of Special Education. (2006). *Myths about response to intervention (RtI) implementation.* Retrieved May 2017, from http://www.nasdse.org/Portals/0/Documents/Download%20Publications/Myths%20about%20RtI.pdf.

National Center for Education Statistics. (2015). National assessment of educational progress (NAEP) 2015 mathematics assessments. *Digest of Education Statistics*. Washington, DC: U.S. Department of Education Institute of Education Sciences. Retrieved from https://www.nationsreportcard.gov.

National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all.* Reston, VA: NCTM.

National Mathematics Advisory Panel. (2007). Preliminary report: National mathematics advisory panel—January 2007. Retrieved online at https://www2.ed.gov/about/bdscomm/list/mathpanel/reports.html.

Nelson, T. O. (1996). Consciousness and metacognition. *American Psychologist, 51*(2), 102-116.

Nelson, J. R., Benner, G.J., Lane, K. & Smith, B.W. (2004). Academic achievement of k-12 students with emotional and behavioral disorders. *Exceptional Children, 71*(1), 59.

Nelson, R., Martella, R. & Marchand-Martella, N. (2002). Maximizing student learning through the effects of a comprehensive school-based program for preventing problem behaviors. *Journal of Emotional and Behavioral Disorders, 10*(3), 136-148.

Northwest Evaluation Association. (2013). *Measure of academic progress (MAP)*. Portland, Oregon: NWEA. Retrieved from https://www.nwea.org/content/uploads/2013/02/MAP-for-Primary-Grades-Overview.pdf.

O'Leary, A. (1985). Self-efficacy and health. *Behaviour Research and Therapy, 23*(4), 437-451.

Oosterlaan, J., & Sergeant, J. A. (1985). *Eunethydis: European approaches to hyperkinetic disorder*. Zurich, Switzerland: Fotototar, Egg.

Otten, K. & Tuttle, J. (2011). *How to reach children with challenging behavior*. San Francisco, CA: Jossey-Bass.

Pajares, F. (1996c). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*, 543-578.

Pajares (2002). *Self-efficacy beliefs in academic contexts: an outline*. Retrieved October 20, 2017, from http://des.emory.edu/mfp/efftalk.html.

Pennington, B. F., Grossier, D., & Welsch, M. C. (1993). Contrasting cognitive deficits in attention deficit disorder versus reading disability. *Developmental Psychology, 29*, 511–523.

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*, 33-40.

Rafferty, L. & Raimondi, S. (2009). Self-monitoring of attention versus self-monitoring of performance: Examining the differential effects among students with emotional disturbance engaged in independent math practice. *Journal of Special Education*, *18*(4), 279-299.

Reid, R., Gonzales, J.E., Nordness, P.D., Trout, A, & Epstein, M.H. (2004). A meta-analysis of the academic status of students with emotional/behavioral disturbance. *Journal of Special Education, 38*(3), 130-143.

Research design and research methods. (2014). In Morgan, D. *Integrating qualitative and quantitative methods* (pp. 45-62). London: SAGE Publications, Inc. doi: 10.4135/9781544304533

Rhode, G., Jenson, W. R., & Reavis, H. K. (1994). *The tough kid toolbox*. Longmont, CO: Sopris West, Inc.

Richardson, J. & Powell, J. (2011). *Comparing special education: Origins to contemporary paradoxes.* Stanford, CA: Stanford University Press.

Rimm-Kaufman, S.E., Baroody, A.E., Larsen, R.A., Curby, T.W., Abry, T. (2015). To what extent to teacher-student interaction quality and student gender contribute to fifth graders' engagement in mathematics learning? *Journal of Educational Psychology, 107*(1), 170-185.

Rinderknecht, K. & Smith, C. (2004). Social cognitive theory in an after-school nutrition intervention for urban Native American youth. *Journal of Nutrition Health, 36*, 298-304.

Rose, H., & Betts, J.R. (2001). *Math matters: The links between high school curriculum, college graduation, and earnings*. San Fransisco, CA: Public Policy Institute California.

Rubia, K., Taylor, A., Taylor, E., & Sergeant, J. A. (1999). Synchronization, anticipation, and consistency in motor timing of children with dimensionally defined attention deficit hyperactivity behavior. *Perceptual and Motor Skills*. 89*:* 1237–1258.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.

Rylance, B. J. (1997). Predictors of high school graduation or dropping out for youths with severe emotional disturbances. *Behavior Disorders, 23*, 5-17.

Salminen, T., Strobach, T., & Schubert, T. (2012). On the impacts of working memory training on executive functioning. *Frontiers in Human Neuroscience, 6*.

Scheuerman, B. & Hall, J. (2012). *Positive behavioral supports for the classroom*: 2nd edn. Upper Saddle River, NJ: Pearson.

Shapka, J.D., Domene, J.F., & Keating, D.P. (2006). Trajectories of career aspirations through adolescence and young adulthood: Early math achievement as a critical filler. *Educational Research and Evaluation, 12*(4), 347-358.

Shores, R. & Wehby, J. (1993). Analyzing the classroom social behavior of students with EBD. *Journal of Emotional and Behavioral Disorders, 7*(4), 194-199.

Schunk, D. H., & Hanson, A. R. (1985). Peer models: Influence on children's self-efficacy and achievement. *Journal of Educational Psychology, 77*(3), 313-322.

Schunk, D.H. (1982). Effects of effort attributional feedback on children's perceived self-efficacy and achievement. *Journal of Educational Psychology, 74*, 548-556.

Schunk, D. H., & Pajares, F. (2002). The development of academic self-efficacy. In A. Wigfield & J. S. Eccles (Eds.), *A Vol. in the educational psychology series. Development of achievement motivation* (pp. 15-31). San Diego, CA, US: Academic Press.

Shea, P., & Bidjerano, T. (2010). Learning presence: Towards a theory of self-efficacy, self-regulation, and the development of a communities of inquiry in online and blended learning environments. *Computers & Education, 55*(4), 1721-1731.

Siegler, R.S., Duncan, G.J., Davis-Kean, P.E., Duckworth, K., Claessens, A., Engel, M., Susperreguy, M.I., & Chen, M. (2012). Early predictors of high school mathematics achievement. *Psychological Science, 23*(7), 691-697.

Simpson, R., Peterson, R., & Smith, C. (2011). Critical educational program components for students with emotional and behavioral disorders: science, policy, and practice. *Remedial and Special Education, 32*(3), 230-242.

Singer, E. & de Haan, D. (2007). *The social lives of young children: play, conflict, and moral learning in day-care groups.* Amsterdam: SWP.

Stuckey-Smith, F. & Wogan, J. (nd) Mt. diablo unified RtI for behavior. Retrieved online at https://www.slideshare.net/jameswogan/rti-for-behavior.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Boston: Pearson/Allyn & Bacon.

Templeton, T. N., Neel, R. S. & Blood, E. (2008). Meta-analysis of math interventions for students with emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders*, *16*(4), 226-239.

Thompson, S. J., Lazarus, A.T., Thurlow, L & Clapper, M. L. (2005). Adequate yearly progress of students with disabilities: Competencies for teachers. *Teacher Education and Special Education, 38*(4), 232-240.

Thomas, A. (2019). *Multiple intelligences student survey.* Retrieved online March 1, 2019 from https://www.teacherspayteachers.com/Product/Multiple-Intelligences-Student-Interest-Survey-264613.

Toglia, J. & Kirk, U. (2000). Understanding awareness deficits following brain injury. *NeuroRehabilitation, 15*(1), 57-70.

Tominey, S.L. (2011). Red light, purple light: findings from a randomized trial using games to improve behavioral self-regulation in pre-school. *Early Education and Development, 22*, 489-519.

Tremblay, R.E., Nagin, D.S., Seguin, J.R. et al.,. (2004). Physical aggression during early childhood: trajectories and predictions. *Pediatrics, 114*(1), 3-9.

Tripp, G., Ryan, J., & Peace, K. (2002). Neuropsychological functioning in children with *DSM-IV* combined type attention deficit hyperactivity disorder. *Australian and New Zealand Journal of Psychiatry, 36*, 771–779.

Trommer, B. L., Hoeppner, J. B., Lorber, R., & Armstrong, K. J. (1988). The go-no-go paradigm in attention deficit disorder. *Annals of Neurology*, *24*, 610–614.

Trout, A. L., Nordness, P. D., Pierce, C. D., & Epstein, M. H. (2003). Research on the academic status of children with emotional and behavioral disorders: A review of the literature from 1961 to 2000. *Journal of Emotional and Behavioral Disorders*, *11*(4), 198-210.

Urdan, T.(2005). *Statistics in plain English,* 2nd edn. New York, NY: Psychology Press.

U. S. Department of Education. (1983). *A nation at risk*. Retrieved online at https://www2.ed.gov/pubs/NatAtRisk/risk.html.

U. S. Department of Education. (2016). *Fast facts.* Retrieved from https://www.ed.gov/esea.

U. S. Department of Education. (2018). *National assessment of educational progress.* Retrieved online from nces.ed.gov/nationsreportcard/.

Usher, E. & Pajares, F. (2008). Self-efficacy for self-regulated learning: A validation study. *Educational and Psychological Measurement*, *68*(3), 443-463.

Van der Donk, M. L., Hiemstra-Beernink, A., Tjeenk-Kalff, A.C., van der Leij, A. V. (2013). Interventions to improve executive functioning and working memory in school-aged children with AD(H)D: a randomized controlled trial and stepped-care approach. *BMC Psychiatry*, *13*(23). Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3548701.

Voigt-Zabinski, V. (2017). *Evidence-based interventions for elementary students with emotional or behavioral disorders.* Retrieved online January 5, 2019, from https://repository.stcloudstate.edu/sped_etds/47/

Vygotsky, L. (19621978). *Mind in Society*. Cambridge MA: MIT Press. (Original work published in 1930.)

Wagner, M. & Davis, M. (2006). How are we preparing students with emotional disturbances for the transition to you adulthood?: Findings from the national longitudinal study-2. *Journal of Emotional and Behavioral Disorders.* Retrieved online April 14, 2019 from https://doi.org/10.1177/10634266060140020501

Wagner, M., Friend, M., Bursuck, W., Kutash, K., Duchnowski, A. J., Sumi, W. C., & Epstein, M. H. (2006). Educating students with emotional disturbances: A 77 national perspective on school programs and services. *Journal of Emotional and Behavioral Disorder*, *14*(1), 12-30.

Wagner, M., Kutash, K., Duchnowski, A. J., Epstein, M. H., & Sumi, W. C. (2005). The children and youth we serve: A national picture of the characteristics of students with emotional

disturbances receiving special education. *Journal of Emotional and Behavioral Disorders, 13,* 79-96.

Walker, H., Ramsey, E., & Gresham, F. (2004). *Antisocial behavior in schools: Evidence-based practices* (2nd ed.). Belmont, CA: Wadsworth.

Walker, H., Seeley, J., Small, J., Severson, H., Graham, B., Feil, E., & Forness, S. R. (2009). A randomized controlled trial of the First Step to Success early intervention: Demonstration of program efficacy outcomes in a diverse, urban school district. *Journal of Emotional and Behavioral Disorder, 17,* 197–212

Wehby, J., Symons, F., & Shores, R.E. (1995). A descriptive analysis of aggressive behavior in classrooms for children with emotional and behavioral disorders. *Educational Psychology, 20,* 87-105.

Wehby, J., Falk, K.B., Barton-Arwood, S., Lane, K.L., & Cooley, C. (2003). The impact of comprehensive reading instruction on the academic and social behavior of students with emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders, 11,* 225–238.

Wehby, J. & Kern, L. (2014). Intensive behavior intervention: "What is it," What is its evidence base, and why do we need to implement now. *Teaching Exceptional Children, 46*(4), 38-44.

Weiner, B. (1979). A theory of motivation for some classroom experiences. *Journal of Educational Psychology, 71*(1), 3-25.

Wills, H. & Mason, B. (2014). Implementation of a self-monitoring application to improve on-task behavior: A high school pilot study. *Journal of Behavior Education, 23*(4), 421-434.

Woodcock, R.W., McGrew, K.S, & & Mather, N. (2001) Test review. Itasca, IL: Riverside Publishing.

Woodward, J. & Montague, M. (2002). Meeting the challenge of mathematics reform for students with LD. *The Journal of Special Education.* Retrieved online 4/14/19 https://doi.org/10.1177%2F00224669020360020401.

Woodward, J. (2001). Constructivism and the role of skills in mathematics instruction for academically at-risk secondary students. *Special Services in the Schools, 17*(1/2), 15-32.

Yackel, E. (2002). What we can learn from analyzing the teacher's role in collective argumentation. *The Journal of Mathematical Behavior, 21*(4), 423-440.

Zentall, S. S., & Leib, S. (1985). Structured tasks: Effects on activity and performance of hyperactive and normal children. *Journal of Educational Research, 79,* 91-95.

Zigmond, N. (2006). Twenty-four months after high school: Paths taken by youth diagnosed with severe emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders, 14*(2), 99-107.

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*(3), 329-339. http://dx.doi.org/10.1037/0022-0663.81.3.329

Appendix A: IRB Approval

UNIVERSITY OF ARKANSAS

To:	Anna Kristen Bensinger
From:	Douglas James Adams, Chair IRB Committee
Date:	04/19/2019
Action:	**Expedited Approval**
Action Date:	04/19/2019
Protocol #:	1903181535
Study Title:	The Impact of Student Self-Efficacy for Behavior During Mathematics Instruction for Elementary Students with Emotional Behavioral Disorders
Expiration Date:	04/03/2020
Last Approval Date:	

The above-referenced protocol has been approved following expedited review by the IRB Committee that oversees research with human subjects.

If the research involves collaboration with another institution then the research cannot commence until the Committee receives written notification of approval from the collaborating institution's IRB.

It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date.

Protocols are approved for a maximum period of one year. You may not continue any research activity beyond the expiration date without Committee approval. Please submit continuation requests early enough to allow sufficient time for review. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study closure.

Adverse Events: Any serious or unexpected adverse event must be reported to the IRB Committee within 48 hours. All other adverse events should be reported within 10 working days.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, study personnel, or number of participants, please submit an amendment to the IRB. All changes must be approved by the IRB Committee before they can be initiated.

You must maintain a research file for at least 3 years after completion of the study. This file should include all correspondence with the IRB Committee, original signed consent forms, and study data.

cc: Tom Smith, Key Personnel

Appendix B: Approval Letter from School Principal

February 25, 2019

Dear Mrs. Bensinger:

I am in support of the research study below by investigator Kristen Bensinger.

Project Title: **The Impact of Student Self-efficacy for Behavior During Mathematics Instruction for Students with Emotional Behavioral Disorders**

Investigator:
Kristen (Scott) Bensinger, Candidate for PhD
Curriculum and Instruction
University of Arkansas Fort Smith
5210 Grand Avenue, Echols room 1108
Fort Smith, AR 72913
Kristen.Bensinger@uafs.edu

Description: The current study explores the impact of the behavior intervention during mathematics lessons on the behavior of students and teachers. In order to understand the impact, the researcher will train 4th grade teachers to implement the strategy with children with Emotional Behavioral Disorder. The intervention includes individual meetings with each student and his/her teacher to support the child in setting goals related to on-task learning behavior during mathematics instruction in the classroom. The intervention also includes a self-management check sheet in which children may record his or her demonstration of good classroom behavior. The researcher will collect data on the teacher's behavior and the child's behavior before and after implementation of the intervention. You will be asked to complete a survey to indicate your satisfaction with the intervention. The investigator is seeking to understand: the impact of the intervention, the impact of goal setting and self-efficacy on the behavior of students and teachers, the impact of on-task learning behavior on mathematics achievement and teacher and parent satisfaction with the implementation of the intervention.

Students/Parents will be asked to:

1. Attend his or her usual class.
2. By observing in the classroom, allow investigators to collect data on children's behavior before the implementation of the intervention.
3. By observing in the classroom, allow investigators to collect data on children's behavior during implementation of the intervention.
4. By observing in the classroom, allow investigators to collect data on children's behavior during a follow-up session, approximately three weeks after the data collection period ends.
5. Allow investigator to access school records, including, birthdate, demographic characteristics, eligible disability, IEP services.

The research team is prepared to support children's participation in the intervention based on his or her strengths and interests. If you choose to allow your child to participate, Kristen Bensinger will contact you about specific accommodations that may be needed to support such participation.

[redacted]

Risks and Benefits: There are no anticipated risks associated with this project. Anticipated broad benefits of participation include identifying a classroom behavior management intervention that increases student on-task behavior and decreases problem behaviors, which may lead to increased instruction and academic engagement time and increased achievement in mathematics.

Voluntary Participation: Children's participation in the research is completely voluntary. Parents may decide to withdraw their child from the study at any time. If they decide to withdraw, there will be no penalty or negative consequences for such decision.

Confidentiality: A code number will be assigned to match the documents and observations to children as participants. A linking document of code numbers and children's information will be kept separately in a secure file cabinet. All information will be kept confidential to the extent allowed by law and University policy. Results from the research will be reported as aggregate, group data and individual data. Individual student data confidentiality will be ensured through use of pseudonyms linked to assigned code number. All materials will be kept for a minimum of three years after the conclusion of the study.

Right to Withdraw: Parents are free to refuse their child's participation in the research and to withdraw him or her from this study at any time. Their decision to withdraw will bring no negative consequences — no penalty to parents or children.

As Principal at Spradling Elementary in Fort Smith, I agree to support the implementation of this intervention and to provide the researchers with behavior tools and assessment measures which are used school-wide.

Sincerely,

Roberta Dawson

Principal

Spradling Elementary

Appendix C: Parent Informed Consent

PARENT INFORMED CONSENT
Impact of Intervention of Behavior of Teacher and Students

March 2019

Dear Parent:

We have an exciting opportunity to participate in research to support mathematics learning in the regular classroom. A description of the research project is below, and you can also request to meet with the researcher, Principal Investigator, Kristen (Scott) Bensinger for additional information about this project by emailing Mrs. Bensinger, emailing your child's teacher, or contacting the school administrator.

Project Title: **The Impact of Student Self-efficacy for Behavior During Mathematics Instruction for Students with Emotional Behavioral Disorders**

Principal Investigator:
Kristen (Scott) Bensinger, Candidate for PhD
Curriculum and Instruction
University of Arkansas Fort Smith
5210 Grand Avenue, Echols room 110B
Fort Smith, AR 72913
Kristen.Bensinger@uafs.edu

Description: The current study explores the impact of your child's effectiveness at goal setting for behavior during mathematics lessons and the related impact on the behavior of students and teachers. In order to understand the impact, the researcher will train your child's teacher to implement the goal-setting strategy with your child. The intervention includes individual meetings with your child and his/her teacher to support your child in setting goals related to on-task learning behavior during mathematics instruction in your child's classroom. The intervention also includes a self-management check sheet in which your child may record his or her demonstration of good classroom behavior. The researcher will collect data on your child's teacher's behavior and your child's behavior before and after implementation of the intervention. You may also be asked to complete a survey to indicate your satisfaction with the intervention. The investigator is seeking to understand: the impact of the intervention, the impact of goal setting and self-efficacy on the behavior of students and teachers, the impact of on-task learning behavior on mathematics achievement and teacher and parent satisfaction with the implementation of the intervention.

<u>Your child is being asked to:</u>

1. Attend his or her usual class.
2. Although parent permission is required for your child's participation, upon your approval, your child will be asked to provide their consent for participation in this study.
3. By observing your child, allow investigators to collect data on your child's behavior before the implementation of the intervention.
4. By observing your child, allow investigators to collect data on your child's behavior during implementation of the intervention.

5. Complete a Student Interest Inventory and Strengths Difficulties Questionnaire when read aloud.
6. Complete a survey which is read aloud that will evaluate how satisfied they are with the implementation of the intervention. Should take no more than 10 minutes to complete.
7. By observing your child, allow investigators to collect data on your child's behavior during a follow-up session, approximately two weeks after the data collection period ends.
8. Complete self-reflection scoring on their behavior goal sheets throughout mathematics instruction for 4-6 weeks.
9. Meet daily with their classroom teacher to reflect on progress toward their goals for on-task learning behaviors during mathematics instruction.
10. Allow investigator to access school records, including, birthdate, demographic characteristics, eligible disability, IEP services and mathematics achievement.
11. Along with their class, complete teacher-assigned assessments for mathematics.
12. Complete the Consumer Satisfaction Elementary Survey when read aloud to them after the conclusion of the Intervention.

<u>Parents are being asked to:</u>

1. Support your child's attend at his or her usual class.
2. Provide parent permission for your child's participation in this study.
3. By observing your child, allow investigators to collect data on your child's behavior before the implementation of the intervention.
4. By observing your child, allow investigators to collect data on your child's behavior during implementation of the intervention.
5. By observing your child, allow investigators to collect data on your child's behavior during a follow-up session, approximately two weeks after the data collection period ends.
6. Complete the Consumer Satisfaction Survey after the conclusion of the Intervention.

The research team is prepared to support your child's participation in the intervention based on his or her strengths and interests. If you choose to allow your child to participate, Kristen Bensinger will contact you about specific accommodations that may be needed to support such participation.

Risks and Benefits: There are no anticipated risks associated with this project. Anticipated broad benefits of participation include identifying a classroom behavior management intervention that increases student on-task behavior and decreases problem behaviors, which may lead to increased instruction and academic engagement time and improved achievement in mathematics.

Voluntary Participation: Your child's participation in the research is completely voluntary. You may decide to withdraw your child from the study at any time. If you decide to withdraw, there will be no penalty or negative consequences for such decision.

Confidentiality: A code number will be assigned to match the documents and observations to your child as a participant. A linking document of code numbers and your child's information will be kept separately in a secure file cabinet. All information will be kept confidential to the extent allowed by law and University policy. Results from the research will be reported as aggregate, group data and individual data. Individual student data confidentiality will be ensured through use of pseudonyms linked to assigned code number. All materials will be kept for a minimum of three years after the conclusion of the study.

Right to Withdraw: You are free to refuse your child's participation in the research and to withdraw him or her from this study at any time. Your decision to withdraw will bring no negative consequences — no penalty to you or your child.

Informed Consent

I, (please print) _____, have read the description, including the purpose of the study, the procedures to be used, the potential risks, the confidentiality, as well as the option to withdraw from the study at any time. The investigator has explained each of these items to me. The investigator has answered all of my questions regarding the study, and I believe I understand what is involved. My signature below indicates that I freely agree to participate in this study and that I have received a copy of this agreement from the investigator.

_____

Child's Name (please print) Date

_____

Parent Signature Date

_____

Parent Preferred Method of Contact (Phone Number or Email)

_____

Investigator Signature Date

If you have questions or concerns about this study, you may contact the primary investigator Kristen Bensinger by e-mail at Kristen.Bensinger@uafs.edu or phone 479-435-1385 or faculty supervisor Tom Smith at tecsmith@uark.edu. For questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's IRB Coordinator, at (479) 575-2208 or by e-mail at irb@uark.edu.

Appendix D: Behavior Rating Goal Sheet

SPRADLING Eagles Soarin' for a Great Day!

Name #3_____ Date _____

My Goal: I will stay in my assigned area during math time.

My Check-in	Am I meeting my goals?
#1	
#2	
#3	
#4	
#5	
#6	
#7	
#8	
Total	/24 points possible

= Not Meeting Goals

= Partially Meeting Goals

= Amazing at Meeting Goals!

Appendix E: IRP-15 Consumer Satisfaction Survey

Teacher Post-Survey

Respond to each item with 6 being strongly agree and 1 being strongly disagree.

Statement
16. This would be an acceptable intervention for children's problem behavior.
17. Most teachers would find this intervention Appropriate for behavior problems.
18. This intervention should prove effective in changing children's problem behavior.
19. I would suggest the use of this intervention to other teachers.
20. The children's problem behaviors are severe enough to warrant the use of this intervention.
21. Most teachers would find this intervention suitable for the problem behaviors.
22. I would be willing to use this intervention in the classroom setting.
23. This intervention would not result in negative side-effects for children.
24. This intervention would be appropriate for a for a variety of children.
25. This intervention is consistent with those I have used in classroom settings.
26. The intervention was a fair way to handle children's problem behaviors.
27. This intervention is reasonable for problem behaviors.
28. I like the procedures used in this intervention
29. This intervention was a good way to handle children's problem behaviors.
30. Overall, this intervention would be beneficial to children.

Note. Adapted from Martens, B. & Witt, J. (1982) The Intervention Rating Profile. University of Nebraska-Lincoln.

Appendix F: Start-up Fidelity Checklist

Start-Up/Initial Fidelity of Intervention Checklist

Y N NA 1. I participated in up to two 60-minute training sessions with the Researcher.

Y N NA 2. I met with each targeted student prior to the start of the intervention to support the student in selecting one or two individual behavior goals for themselves during mathematics instruction.

Y N NA 3. I administered the Strengths Difficulties Questionnaire and the Student-Interest Inventory with all targeted students.

Y N NA 4. I set weekly rewards and incentives with each student based on student interests.

Y N NA 5. I provided direct instruction for each student and modeled how to complete their individual goal chart.

Appendix G: Ongoing Fidelity Checklist

Ongoing Fidelity of Intervention Checklist

Y N NA 1. I ensure that each child has a clean copy of their daily goal sheet prior to beginning mathematics class.

Y N NA 2. I meet daily with each targeted student during the course of the intervention for up to 10 minutes to review progress the student is making toward their goals during mathematics instruction.

Y N NA 3. I have participated in the training with the Researcher on effort-ascribed feedback and the implementation of effort-ascribed feedback statements during math instruction and during daily meetings with students to reflect on progress toward goals.

Y N NA 4. I record student attendance during math instruction and student attendance during daily coaching meetings.

Y N NA 5. I practice providing effort-ascribed feedback with on-task behavior expectations, students' goals and on student mathematics work.

Y N NA 6. I administer the mathematics CFAs, CSAs, and MAPS as scheduled throughout the intervention and at the end of the intervention.