THE EFFECT OF MUSIC ON DISRUPTIVE BEHAVIOR IN STUDENTS WITH EMOTIONAL/BEHAVIORAL DISORDERS

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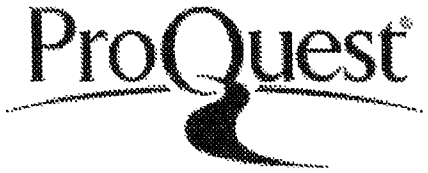

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Abstract

THE EFFECT OF MUSIC ON DISRUPTIVE BEHAVIOR IN STUDENTS WITH EMOTIONAL/BEHAVIORAL DISORDERS

ANTHONY ROTHFORK

The purpose of this study was to evaluate the effectiveness of listening to music as an intervention to improve disruptive behavior in middle school age children with emotional/behavioral disabilities. Five middle-school students participated in a single-subject design, which involved a multiple baseline across subjects and settings. Students listened to an eight-minute recording of classical music on an iPod before engaging in an independent math or reading assignment while seated at their desk. The researcher used fixed rate recording to collect data over a five-minute session. No significant differences were found between pre-treatment and post-treatment for the targeted behaviors observed during the study. The small sample size of the study is cited as the possible reason for the negative results. Limitations as well as directions for future research are also discussed.

ACKNOWLEDGMENTS

Music gives a soul to the universe, wings to the mind,

flight to the imagination and life to everything.

-Plato

I wish to begin by thanking my family for their support throughout this experience. My wife, Barbara, was eternally full of encouragement and bolstered my morale through some of the more challenging times over the course of this marathon task. The enthusiasm of my children, Jacqueline, Kyle, and Katherine, was inspirational and invigorating, providing me with strength and hope along the seemingly endless journey. My brother, Dr. John Rothfork, and his wife, Dr. Erika Konrad, are responsible for persuading me to plunge into this undertaking with full commitment. My eternal thanks to both of you for opening my eyes to the enriching opportunities created by this adventure.

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Finally, I would like to thank the students, teachers, and paraprofessionals who participated in this study. While they remain anonymous to the reader, I will always fondly remember them; without their participation, this study would not have been possible.

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CHAPTER ONE: INTRODUCTION

The purpose of this chapter is to provide an overview of the definition, characteristics, and prevalence rates of emotional and behavioral disorders (EBD) associated with school-aged children. Second, the chapter presents a discussion of the findings from studies examining the use of music as an intervention for talk-outs and out of seat classroom behavior, which interferes with the learning process among children with EBD. Third, this chapter identifies the statement of the problem in the present study and concludes with the significance of the study and its research questions. This manuscript outlines the research about EBD and music, with Chapter Two, in particular, offering a substantive analysis of these bodies of research.

Throughout this study, the acronym EBD refers to individuals with challenging behavior. The fields of psychology and education use EBD as it is more inclusive than the term emotional disturbance (ED), cited in the federal definition and taken from The Individuals with Disabilities Education Improvement Act of 2004 (IDEA) (Farley, Torres, Wailehua, & Cook, 2012). According to IDEA, to be diagnosed as having an emotional disturbance, an individual must demonstrate one or more of five characteristics over an extended period, to a marked degree, and which adversely affects a child's educational performance. The five characteristics are: (a) an inability to learn that cannot be explained by intellectual, sensory, or health factors; (b) an inability to build or maintain satisfactory interpersonal relationships with peers and teachers; (c) inappropriate types of behavior or feelings under normal circumstances; (d) a general pervasive mood of unhappiness or depression; and, (e) a tendency to develop physical symptoms or fears associated with personal or school problems.

As defined by IDEA, EBD includes schizophrenia but does not apply to children who are socially maladjusted, unless it is determined they have an EBD (Individuals with Disabilities

Education Act, 20 U.S.C., 2004; PL 108-446, 20 CFR, 300.8[c][41]). As an alternative to the federal definition, the National Mental Health and Special Education Coalition, a group of more than 30 professional mental health and special educators, proposed the reference to EBD (Forness & Knitzer, 1992). The authors of this proposal felt there was a need to better operationalize the current definition to include other disability conditions and is less stigmatizing than the term ED.

The new term EBD frames the disability as a behavioral or emotional response in school so different from appropriate, age, cultural, or ethnic norms that it adversely affects educational performance. Educational performance would include social, vocational, and personal skills, as well as academic. Three conditions for the disability would include: (a) more than a temporary, expected response to stressful events in the environment; (b) which is consistently exhibited in two settings, at least one that is school-based; and (c) is unresponsive to direct intervention in the general education classroom or the condition is such that general interventions would be insufficient (Forness & Kavale, 2000).

Students with EBD are demanding and challenging for both parents and educators. The high school dropout rates for students with EBD are significantly higher than that of students in other special education categories (U.S. Department of Education, 2012). Other disturbing statistics indicate an association with higher rates of unemployment, lower probabilities for success in postsecondary settings, higher risk for involvement with the legal system, and problems in community living. Students with EBD are also likely to receive special education services in a self-contained setting more frequently than students with other disabilities and remain in that setting for longer periods of time (Gargiulo, 2012; Heward, 2013; Walker, Ramsey, & Gresham, 2005). Emotional behavioral disorders are typically characterized by

impairments or deficits in social skills and interpersonal relationships that often are expressed in both externalizing and internalizing behaviors adversely affecting a child's academic achievement and social relationships (Heward, 2013).

Overview of Emotional Behavioral Disorders (EBD)

The Individuals with Disabilities Education Act (IDEA) provides the legal federal definition for the disability category of EBD. Criticism and lack of consensus continues to exist among practitioners about the specificity of the generally accepted definition of EBD. Although the federal definition prescribes the three necessary criteria warranting a diagnosis of an emotional disorder; i.e., chronicity, severity, and experiencing difficulty in school, some have criticized the definition for being exceptionally vague. Imprecise terms such as "satisfactory" and "inappropriate" have various meanings among different cultural and ethnic groups (Cullinan & Kauffman, 2005). Consequently, this confusion and subjectivity mean that many students with emotional or behavioral problems are not identified and are denied services (Kauffman & Landrum, 2009). Disordered or unacceptable behavior is a social construct for which there is no clear agreement about what comprises good mental health (Bower, 1982). Most children, at times, behave inappropriately to generally accepted standards.

In addition, there are questions of the frequency, duration, and intensity required before student behaviors are considered disabling. Second, theories differ concerning causal facts and terminology used in conjunction with an emotional disturbance. Third, marked variations exist among diverse ethnic and cultural groups. Last, EBDs often coexist with other disabilities, which further complicates the ability to identify whether one condition causes, or is the product of the other (Heward, 2013). Given the problems associated with the definition, it becomes increasingly

challenging to determine objective prevalence rates for EBD among school districts throughout the United States.

Prevalence

Despite wide variations across school districts in the United States, estimates of the prevalence rates of EBD among school-aged children continue to rise. The most recent statistics available indicate about 1% of the student population in U.S. public schools receive special education services under the category EBD (National Research Council, 2002; U.S. Department of Education, 2011). Data from similar studies suggests the actual number of students with EBD is closer to 3 to 6% (Kauffman & Landrum, 2009), and over three-quarters of children identified for special education services in U.S. schools for an EBD are male (Heward, 2013; Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005). Given the increasing prevalence of students identified as EBD in schools, there continues to be a need for teachers qualified to teach these students using academic and behavioral interventions derived from evidence-based practices (EBPs). Teaching these students requires strategies designed to support and improve student behavior. These empirically based practices include: functional behavioral assessments (FBA), behavioral intervention plans (BIP), positive reinforcement and consequences, self-management or self-monitoring, establishing routines, rules, and structure, as well as creating safe, positive learning environments (Regan & Michaud, 2011). Specific EBPs can be found among five web-based national organizations: The Center for Effective Collaboration and Practice, the National Comprehensive Center for Teacher Quality, the IDEA and Research for Inclusive Center, the Technical Assistance Center on Positive Behavioral Interventions and Supports (PBIS), and Teaching LD and Current Practice Alerts (Horner et al., 2005; Mooney, Ryan, Uhing, Reid, & Epstein 2005).

Children identified under the category of EBD provide challenges for both general and special education teachers. Both types of teachers must provide these children with an appropriate education and effective behavioral interventions in their classrooms. Children under this category often exhibit either externalizing or internalizing behaviors and many cannot form long term and stable relationships. There is a strong negative correlation between academic achievement and disruptive behavior; i.e., the lower the academic achievement, the higher the disruptive behavior, which tends to be expressed as a reciprocal relationship (i.e., each influences the other) (Landrum, Tankersley, & Kauffman, 2003).

Examples of externalizing behaviors inside the classroom often include antisocial acts such as getting out of one's seat, yelling, talking out of turn, cursing, disturbing peers, ignoring the teacher, destroying property, non-compliance with teacher directives, and temper tantrums (Rhode, Jenson, & Reavis, 1998). Other students with EBD have internalizing behaviors that manifest in acts of immaturity and withdrawal. These children lack social skills and often are alone, finding comfort in fantasy and daydreams, with some experiencing phobias and cycles of deep depression (King, Heyne, & Ollendick, 2005; Maag & Swearer, 2005). Any of these behaviors seriously affect a student's opportunities to participate in learning activities in general education classrooms and engage in recreational activities with other students outside the classroom. Academically, data indicates most students with EBD function a year or more below grade level in most academic subjects (Cullinan, 2007). With higher absenteeism, 60% drop out of high school; only one in three receive a high school diploma or certificate of completion (Landrum, Katsiyannis, & Archwamety, 2004). Additionally, many of these students have comorbid conditions, such as a language delay or a learning disability, which further

compromises their abilities to engage in and maintain engagement in academic pursuits (Nelson, Benner, & Cheney, 2005).

To address the behavioral deficits of children EBD, researchers have developed several educational approaches, along with using a variety of educational placement alternatives. Despite the trend to include more students with disabilities in general education classrooms, only 39% of students with an emotional disturbance spent at least 80% or more time in a regular classroom (Congressional Research Service, 2013). Students who are served in more restrictive settings often display even more disruptive behaviors, including extreme aggression, lack of self-control, or severe withdrawal. Because these maladaptive behaviors pose a safety risk to others, these children are prevented from spending more time with non-disabled peers in general education classrooms (Meadows, Neel, Scott, & Parker, 1994). Many of these students have been traumatized and are hyper-vigilant, continually scanning the environment for potential sources of danger (Perry, 2006). Consequently, they are unable to focus their attention on academics. Brain research has shown traumatized youth often have strongly developed fear and survival responses, leaving them in a state of anxiety and hyper-awareness that makes it difficult to concentrate and listen in the classroom; many are prone to outbursts (Perry, 2006).

Music has been shown to be an efficacious intervention for many individuals with a wide range of disabilities. In an effort to meet the needs of those students with EBD who have failed to respond positively to current identified best practice interventions and supports, music as an environmental antecedent may offer a degree of support. An overview of music as an intervention follows.

Music as an Intervention

Although studies have established the influence of music in reducing off-task behaviors for individuals with disabilities, there are no similar empirical studies published to date on the effects of listening to music may have on students with EBD. The studies discussed below support the possibility for demonstrating an effect between listening to background music and reducing disruptive behaviors among students with EBD.

To address the behavioral deficits of children with EBD, Hong, Hussey, and Heng (1998) examined the efficacy of music in decreasing disruptive behaviors. Researchers in numerous related studies have reported similar findings in working with a variety of populations (Conroy, Dunlap, Clarke, & Alter, 2005; Hitchen, Magee, & Soeterik, 2010; Hussey, & Layman, 2003; Robb, 2003; Sussman, 2009).

Music therapists perform many of the evidence-based interventions involving the use of music with the goal of creating positive changes in emotional, physical, psychological, or social functioning of children with educational problems (American Music Therapy Association, 2014). For example, playing background music is effective in increasing emotional understanding in children with autism, which is vital to their social interactions with others (Katagiri, 2009). Additionally, clinical studies have shown the benefits of using music as an intervention, producing desirable effects on the emotional, cognitive, physical, and social needs of children, whose anxiety impedes their abilities to communicate their emotions to others (Melfsen, Osterlow, & Florin, 2000). Schoenfeld and Janney (2008) found that students with EBD frequently have mental health conditions or intense functional impairments that can interfere with their academic success. Their literature review documents how anxiety disorders are one of the most commonly diagnosed psychiatric conditions found in children with EBD and that most

treatment approaches are not suitable for use in public schools. Their study used a music therapy approach in treating traumatized individuals, demonstrating how music is used as an intervention in treating severely traumatized individuals. Music has been found to facilitate their efforts to improve self-regulation and reduce disruptive behaviors. Music seems to help students modulate between increased states of arousal and complete numbness, restoring a more normal state of stability (Montello, 1999; Perry, 2006; Stroul & Friedman, 1994).

Hussey et al. (2003) indicate music therapy can increase self-esteem and create classroom environments that are nonthreatening to students with EBD, helping to decrease symptoms of arousal or disinhibition. Theoretically, this process allows children to proceed at their own pace in encountering, organizing, and improving self-regulation. In a case study with Sarah, a nine year old African American girl, who was traumatized from sexual abuse, neglect, and abandonment, Hussey et al. (2000) used music therapy, along with an activity-based lesson to help her self-regulate and develop prosocial skills. Using the recording "Hands" by Jewel, Sarah was directed to follow the music and actively listen to the meaning of the lyrics. This activity was repeated at home with Sarah, with her foster mother using a sticker token economy as reinforcement for Sarah's participation. Researchers discovered that, with the use of music, Sarah was more able to discuss and process events in her life that were interfering with her ability to focus and engage in activities and academics with greater success.

In a comparison study on the effects of active versus passive use of music as an intervention with preadolescents with EBD and learning disorders (LD), researchers found music therapy had a significant positive effect on reducing disruptive targeted behaviors. The study included 16 student participants diagnosed as EBD, LD, or attention deficit disorder with a mean age of 12 years, in a public middle school in New York City. Seven were Black, six were White,

and three were Hispanic, from varied socio economic statuses. Targeted behaviors were low frustration tolerance levels, depression, hyperactivity, short attention span, and high levels of impulsivity. Additionally, all had poor academic levels of performance. The researchers assessed student attention, motivation, and acts of hostility with the Achenbach's Teachers Report Form questionnaire, which represented teachers' observations over one or two 12-week periods prior to and after the music therapy intervention. The assessment instrument had a mean r of .90 for academic ratings and .92 for problem scores. Participants were assigned to one of three groups using a convenience sampling procedure. Group A had an N value of 6, group B=4, and group C=6. Group A was exposed to a passive music therapy intervention for two 12-week periods; group B was exposed to active music therapy for 12 weeks, and group C received active music therapy for two 12-week periods. Researchers collected data at three different times: baseline, middle, and end of study. Inferential statistical and graphic analyses indicated group C experienced a decline in hostility and motivation problems with a $t(5)=2.48$, $p<.004$. Authors of the study indicated their findings support creating a sense of safety within the environment by using a passive listening intervention approach and is beneficial for students with EBD and LD in reducing targeted behaviors (Montello & Coons, 1998).

Researchers Carey and Halle (2002) demonstrated how background music decreased self-injurious behaviors for a student with severe intellectual disabilities and blindness. Similarly, researchers have shown listening to music improved on-task performance and increased attentive behavior of young children with visual impairments. A study examining the use of background music as an intervention to reduce undesirable behaviors among children with visual impairments found listening to music had a positive effect on targeted standing up behavior. Using a single-participant research design, the researcher selected a 13-year-old female with

profound intellectual disability and blindness to participate in this study due to undesirable behaviors such as tapping, making whining sounds, and turning away in her seat to avoid teacher-led instruction. Using a multielement research design, rapidly alternating between conditions in an A-B-A-B format, background music was used as an intervention to reduce undesirable behaviors. Dependent variables were operationalized as standing up, hitting, and mouth tapping. Comparisons were made between baseline conditions in which no music was played with several eight-minute sessions with music playing, separated by a ten-minute break, over one week. The results indicate the subject engaged in more stereotypic behaviors when background music was absent compared to when it was played. The authors suggested the use of background music may be an effective environmental modification for students with a visual impairment (Desrochers, Oshlag, & Kennelly, 2014; Hallam, Price, & Katsarou, 2002; Robb, 2003).

Statement of the Problem

The prevalence rates of children identified with EBD differ substantially dependent upon the criteria used in determining what comprises emotional or behavioral disability. Estimates range from 8.3% (Roberts, Attkisson, & Rosenblatt, 1998) to 30% (Qi, & Kaiser, 2003). Several studies suggest that 3 to 6% of all school-aged children experience behavioral complications sufficient to be considered disabled (Kauffman & Landrum, 2009). Federal government reports indicate that for the school years 2009-2010, less than 1% of the school-aged population was being served under the IDEA category EBD (U.S. Department of Education, 2011).

Children with EBD have significant deficits affecting academic achievement, social skills, and interpersonal relationships. These children have severe and persistent challenges in responding appropriately to peers and adults and frequently are at high risk for further academic

deficits as well as increasing levels of antisocial behavior toward others or behaviors such as elopement and destruction of property. Children with internalizing behaviors are at risk for anxiety and mood disorders, which interfere with learning (Heward, 2013).

Significance of the Study

This study examines the effects of listening to music on reducing disruptive behaviors and increasing academic engagement time for students with EBD in an educational setting. The importance of this study is predicated on the present condition where educational service delivery for students with EBD is being provided to a large number of students in self-contained classrooms due to the intensity and frequency of their disruptive behaviors (U. S. Department of Education, 2011). Researching whether listening to music has a positive effect on reducing disruptive behaviors in students with EBD would move toward meeting several of the five criteria advanced by Heward (2003) to evaluate the credibility of practices. These criteria are: (a) Has the strategy been used in the classroom? (b) Is there evidence indicating it works? (c) What measures of student performance were used? (d) Have the results been published in a peer-reviewed journal? (e) Is there any evidence to support it being modified and used among various ages and skill levels? (Lewis, Hudson, Richter, & Jonson, 2004).

The literature regarding the use of music therapy in special education points to its efficacy in reducing problem behaviors while increasing attentive behavior in students with disabilities in classroom environments (Elliott, Polman, & McGregor, 2011; Hallam & Price, 1998; Katagiri, 2009; Kim, Wigram, & Gold, 2009; Robb, 2003). Although researchers have noted many positive effects of music therapy in populations with disabilities, scant research has examined listening to music as an intervention with students identified as having EBD.

As educators are placing greater emphasis on inclusion of students with disabilities in general education settings, there is a continuing and, perhaps, even greater need for discovering interventions that are effective in reducing disruptive behaviors hindering the academic success of students with EBD (Giangreco, 2011; Stainback & Stainback, 1996; Taylor, 2005). Although evidence supports the use of music therapy with students with disabilities, the effectiveness of listening to music, particularly, for students with EBD has gone unstudied (Desrochers et al., 2014; Hussey & Layman, 2003).

Purpose of the Study

The purpose of this study was to examine the effects of listening to music as an intervention to reduce talk-outs and out of seat behaviors in children with EBD in a school setting. The following research questions were investigated:

1. To what extent does listening to music decrease talk-outs in children with EBD who exhibit talking-out behavior in a school setting? Here talking out is operationally defined as talking-out or yelling without teacher permission.
2. To what extent does listening to music decrease off-task behaviors in children with EBD behaviors in a school setting? "Off-task" is operationally defined as visual attention not focused on a single target or task for periods of at least 10 seconds or more. For example, when a student is expected to be directing their attention to a classroom teacher, instructional material, or instructional activity but eye gaze is oriented elsewhere, the student is considered to be "off-task" (Ruff & Rothbart, 1996, p.110).
3. To what extent does listening to music decrease out-of-seat behavior in children with EBD who exhibit out-of-seat behavior in a school setting? Out-of-seat behavior is

operationally defined as being out of one's seat without first receiving teacher permission.

CHAPTER TWO: REVIEW OF THE LITERATURE

The purpose of this chapter is to review pertinent literature regarding the history, etiology, characteristics, and prevalence of EBD. This review will be followed by a discussion of the educational challenges confronted by students with EBD and the efficacy of music as an intervention to assist these students in learning environments. In addition, this chapter will present the social validity of using a single case experimental design. The first section traces the history of EBD with a focus on the literature framing the disability in the United States. The second section describes the educational challenges faced by students diagnosed with EBD and addresses current EBPs found useful for teaching students with EBD. The third section addresses the social validity of various theoretical models used in discovering knowledge and providing educational instruction to students with EBD. The final section examines research regarding the technique of the single subject experimental design, tracing its history, usefulness, and efficacy.

Data bases searched include EBSCOhost, ERIC, PsycINFO, and PsycARTICLES. Search terms include music therapy, emotional disability, interventions for children with EBD, EBD history, behavioral interventions, and developmental disorders. The researcher targeted these search terms as they encompass numerous positive behavioral approaches in the literature. Although the researcher attempted to limit studies to those published within the past ten years, he included several older studies as they are considered seminal studies.

History, Characteristics, Academic Deficits, Cause of Emotional/Behavioral Disability

History of EBD

Eli Bower developed the term EBD, later adopted by the U.S. Congress in 1975, during the 1960s (Bower, 1981). His original definition mandated that "emotionally handicapped" exhibit at least one of the following symptoms over an extended period and to a marked degree:

1. An inability to learn which cannot be explained by intellectual, sensory, or health factors;
2. An inability to build or maintain satisfactory interpersonal relationships with peers and teachers;
3. Inappropriate types of behavior or feelings under normal conditions;
4. A general, pervasive mood of unhappiness or depression;
5. A tendency to develop physical symptoms, pain, or fears, associated with personal or school problems (Merrell & Walker, 2004).

Bower's definition also included externalizing and internalizing behavioral indices, which were not yet fully expressed by behavioral researchers. Federal legislation used Bower's definition in developing language, which was later included in developing a description of this disability category (Merrell & Walker, 2004).

The Individuals with Disabilities Education Act provides the current definition of EBD and includes wording derived from Bower, with the additional statements that EBD includes schizophrenia and the term EBD "does not apply to children who are socially maladjusted, unless it is determined that they have an emotional disturbance" defined under the previous conditions (PL 108-446, 20 CFR 300.8[c][4], p.).

Characteristics of Individuals with EBD

Observable abnormal behaviors, which are either externalized or internalized, define individuals with EBD. Examples of externalized behaviors include acting out and aggressive actions. Internalized behaviors are defined in terms of social withdrawal or signs of anxiety (Heward, 2013). Externalized behaviors common among school-aged children include observable instances of yelling, talking out, cursing, disturbing peers, getting out of seat, temper tantrums, complaining, excessive arguing, hitting, kicking, ignoring adults, lying, stealing, property destruction, and non-compliance with directives from adults (Colvin, 2004; Rhode, Jenson, Reavis, 1998; Walker, 1997). Research by Dunlap, Strain, Fox, Carta, Conroy, Smith, Kern, Hemmeter, Timm, McCart, Sailor, Markey U., Markey D., Lardieri, & Sowell, 2006) indicate children displaying consistent patterns of disruptive behavior do not generally stop exhibiting these disruptive patterns but, rather, continue and progress into adulthood.

Fewer children have internalized behaviors characterized by reduced social interactions and self-isolation. These students frequently complain about feeling ill or being hurt and, sometimes, have phobias (King, Heyne, & Ollendick, 2005; Maag & Swearer, 2005). These children often go unnoticed and escape identification, which can lead to further isolation and dangerous, self-inflicted incidents or suicidal ideation (Coleman & Webber, 2002; Spirito & Overholser, 2003).

Academic Deficits

Cullinan (2007) reported students with EBD experience academic deficits of at least one or more years in most subject areas. There seems to be a reciprocal relationship between the aberrant behavior displayed by students with EBD and academic success. Often, frustration with academic endeavors leads to defiant or escape behavior, especially when a teacher is unaware of

a student's academic difficulties or is ineffective in addressing the need (Gresham, 2005; Payne, Marks, & Bogan, 2007; Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005). In at least one study, researchers discovered students with any form of a learning disability are at increased risk for EBD and suggest other comorbidities, such as Attention Deficit Hyperactivity Disorder (ADHD) or depression, may also coexist (Mehrotra et al., 2011).

Students with EBD have greater absenteeism rates than any other category of disability, with 44.8% of students ages 14 through 21 having dropped out of high school for the 2006-07 school year. With the gap in academic achievement widening as the student progresses through school, only 42% graduate with a high school diploma or certificate of achievement compared to graduation rates of 56% of all students with disabilities (31st Annual Report to Congress, Tables 19 & 20, 2012).

Many students with EBD also have comorbidity with other challenges, such as a specific learning disability (SLD), ADHD, communication deficits, or language delays. A SLD, as defined by IDEA, includes a disorder in one or more of the fundamental psychological processes people use in understanding or applying either spoken or written language. Specific learning disabilities often manifest as an inexact ability to spell, read, write, think, speak, listen, or compute mathematical calculations. The disorder does not include a learning challenge resulting from motor disabilities, visual, hearing, mental disabilities, emotional disturbance, nor of cultural, environmental, or economic deprivation (PL 108-466, Sec. 602[30]). Having more than one disability further complicates educational successes (Nelson, Benner, & Cheney, 2005). Not only is the confluence of other disorders, such as ADHD, LD, communication or language disorders sometimes present, but factors such as age and severity also affect academic progress in children with EBD. Carroll, Maughan, and Meltzer (2005) discovered a link between an SLD

and psychiatric disorders such as depression, high rates of anxiety, and conduct disorders, all of which can lead to EBD.

In a related study, Rietz, Hasselhorn and Labuhn, (2012) investigated a group of 42 third grade children. The first group all had spelling impairments, while control group participants did not. Parents of students from both groups filled out questionnaires related to their child's externalizing and internalizing behavior difficulties while the students from both groups were assessed academically for spelling and reading. An analysis of the results indicated that children with spelling ability impairments scored higher than those without spelling impairments on scales assessing emotional and ADHD symptoms, respectively. Researchers inferred from this finding that children with spelling impairments are at higher risk for co-occurring challenges, which may lead to an interpretation of an EBD. Many students receiving special education services for EBD also have clinically diagnosed ADHD. Even though ADHD is not one of the categories of disabilities included in IDEA, it is estimated that three-quarters of the students receiving services under the category of EBD also have ADHD, while roughly one-fourth of students receiving services for LD also meet the criteria for ADHD (Forness & Kavale, 2001: LeFever, Villers, & Morrow, 2002; Miranda, Soriano, Fernandez, & Melia, 2008).

Language disorders in students with EBD are also common, especially among younger students. They may manifest as receptive or expressive deficits, or both, and may relate to low IQ scores. About 66% of students with EBD also experience language deficits, with combined receptive-expressive disorders being the most common. Students with language disorders also show significantly poorer achievement and more SLD in all areas compared to students without language disorders (Benner, Mattison, Nelson, & Ralston, 2009; Benner, Nelson, Allor, Mooney, & Dai, 2008).

Causes

Emotional disturbance may stem from biology or environment, or a combination of both (Heward, 2013; Webber & Plotts, 2008). Although many individuals with brain abnormalities from either traumatic injury or brain dsygenesis also experience behavioral and emotional challenges, brain pathology is uncommon among children with EBD (Brauner & Stephens, 2006; Coleman & Webber, 2002). Rhee & Waldman (2002) note evidence indicating a genetic link to various types of emotional disorders, especially schizophrenia.

Environmental factors are primarily responsible for most EBD children. Salient environmental variables associated with EBD include conditions that foster an unhealthy rearing environment and social rejection by peers (Pennington, 2002; Walker et al., 2005). Conditions fostering unhealthy home environments include child rearing practices characterized by inconsistent, authoritarian discipline, parental lack of affection, lack of praise for good behavior, and lack of quality time spent with children in prosocial activities (Heward, 2013; Park, Alber-Morgan, & Cannella-Malone, 2011). Research indicates children from homes in which healthy demonstrations of love and affection are absent or where there are harsh forms of punishment are at risk for EBD (McEvoy & Welker, 2000; Watson & Gross, 2000).

Children with EBD behaviors, typically, are first identified in the school environment. Unstructured academic environments, ineffective instruction, vague rules, lack of teacher praise, and poor or lack of diversity in individual instruction, especially for students from multicultural backgrounds, often contribute to the development of EBD (Furlong, Morrison, & Jimerson, 2004; Sprague & Walker, 2000). Educators who prefer to use punishment over positive reinforcement, rooted in their belief that the punishment is considerably more effective than reinforcement, exacerbates unfavorable academic environments. According to Maag (2001), an

overriding school ethos that values punishment often leads educators to overlook or even misunderstand positive reinforcement in the classroom. Positive consequences and reinforcement are seldom associated with discipline.

Description of Behavioral and Educational Challenges and Current Intervention Strategies

Individuals with EBD are at very high risk for developing secondary conditions such as school-related difficulties due to disruptive behavior and impaired cognitive abilities (Farley, Torres, Wailehua, & Cook, 2012). Because of their disability, many of these students cannot progress academically and socially on par with peers. Symptoms among this population often include attention deficits, difficulty with abstract concepts, difficulty learning from consequences, hyperactivity, immature social behavior, lack of control over emotions, poor problem solving skills, poor impulse control, and poor judgment (Freeman, & Sugai, 2013).

Because of these conditions, students with EBD have higher rates of absenteeism, are at increased risk for dropping out of school and not graduating, have more encounters with the juvenile justice system, and have the highest unemployment rate of any disability four years after leaving high school. They also are at high risk for becoming homeless, have less success in keeping a job and, if female, are six times more likely than their peers to have multiple pregnancies at a young age and lose custody of their babies (Frey & George-Nichols 2003; Boreson, 2006).

Students with EBD are at increased risk for peer victimization and peer-based aggression. Conversely, they also are at risk for much higher levels of bullying and fighting than are other subgroups of students (Rose & Espelage, 2012). Children whose behavior is consistently aggressive and antisocial in early childhood are at increased risk of delinquency in adolescence. Further, they also have increased likelihood of not completing high school, substance abuse,

being arrested, and premature death (Lipsey & Derzon, 1998; Spirito & Overholser, 2003; Walker et al., 2005).

In response to this situation, the most recent authorization of IDEA (IDEA, 2006) and the No Child Left Behind Act (NCLB) of 2001 (2006) mandate the use of EPBs in both academic and behavioral education. Formerly, most behavioral interventions focused primarily on consequence-based interventions designed to punish occurrences of challenging behavior. Most recently, there has been a shift toward designing behavioral interventions based on proactive and positive strategies to prevent challenging behaviors, which focus on providing school-wide positive behavioral supports (SWPBS) more in line with the provisions outlined in IDEA (Conroy, Dunlap, Clarke, & Alter, 2005). This type of framework is designed to reduce children's challenging behaviors by increasing their desirable behaviors through environmental alterations of antecedent sensory stimuli, which is more conducive to individual needs (Odom et al., 2005; Reid, Trout, & Schwartz, 2005; Simonsen, Fairbanks, Briesch, Myers, & Sugai, 2008).

School-wide positive behavioral supports serve as a foundational approach to improving student discipline and establishing an overall positive educational climate. As a framework for positive support, it modifies organizational systems resting on research-based empirically validated intervention practices for establishing and maintaining a school-wide positive and friendly culture. By teaching and implementing EBPs, SWPBS supports developing appropriate and respectful behaviors that promote both the academic and interpersonal success of all students, regardless of whether they have a disability (Sugai et al., 2010). Emphasizing interoperability among data collection, measurable outcomes, EBPs, and systems that implement these practices with fidelity, six principles guide SWPBS. These principles include: (a) developing a continuum of empirically based behaviors and academic interventions and supports,

(b) using data extensively to solve problems and make decisions, (c) proactive altering of environments to prevent development and occurrence of challenging behavior, (d) teaching and encouraging prosocial behavior, (e) implementation of EBPs, and (f) continuous monitoring of student performance and progress (Conroy, Dunlap, Clarke, & Alter, 2005).

The implementation of SWPBS involves three tiers or levels of support targeted to student needs. At Tier 1, universal supports are provided for all students. Generally, at this level, behavioral expectations are stated, defined, and explicitly taught. Appropriate behavior is recognized, acknowledged, and rewarded in all school environments. An important aspect at this level is the provision of using a ratio of four positive adult interactions with students to each negative one. At Tier 2, the emphasis is on prevention, with interventions targeted at students who are at-risk because of their behavior. Interventions include focused support for students who frequently misbehave or for minor rule infractions. Supports may include checking in and out with a counselor or earning rewards at the end of the day for accumulating points throughout the day for acting in a responsible manner. At Tier 3, supports become intensive and focus on individualized interventions for students who are at high-risk because of their behavior. About 5% of students in schools need the interventions and supports provided at this level, which may include wraparound supports outside school to ensure an organized and continuous approach (Dunlap et al., 2010; Horner, Sugai, & Anderson, 2010; Sugai et al., 2010).

Conroy, Sutherland, Haydon, Stormont, and Harmon (2008) noted several early intervention models targeted for children who are at risk for EBD. Programs such as Second Step, Parent Child Interaction Therapy, First Steps to Success, Regional Intervention Program, and Incredible Years address ways in which teachers can implement strategies for dealing with

problem behaviors in the classroom, often by using an ecological approach, but limited empirical evidence indicates their efficacy.

Some children already have established patterns of chronic problem behaviors that include negative interactions with their parents at home, long before beginning school. Children's patterns of behavior based on negative interactions with adults can evolve into coercive relationships with teachers at school, which may develop into conditions counterproductive to favorable learning environments (Conroy, Sutherland, Haydon, Stormont, & Harmon, 2009). Studies indicate academic difficulties, peer rejection, future risk of mental health issues, and negative effects on family often trace back to problems occurring among preschool-aged children who demonstrate problem behavior (Dodge, 1993; Loeber, Burke, Lahey, Winters, & Zera, 2000). Problem behaviors among young children at risk for EBD often include opposition, defiance, disruption, non-compliance with adult requests, and verbal or physical aggression at home with adults. Left untreated, these destructive patterns will likely continue and possibly intensify at school, where there are more demands being placed on the child. Left unaddressed, ultimately, this can limit opportunities and intellectual growth, perpetuating the pattern of antisocial behavior (Dunlap et al., 2006).

Conroy et al. (2009) use the theoretical concept of applied behavior analysis (ABA) embedded in social transactions and the influence of classroom ecology on teacher and student behavior to offer a unique classroom-based ecological approach to early intervention. They base their method on the dynamic contexts of a classroom system, including diverse ecological structures that target behavioral, social, and developmental outcomes for children. In this classroom-based model, teacher-student interaction and can be improved in ways that foster desirable student outcomes (Conroy et al. 2009). The components of their improved ecological

approach include increased instructional pacing, pre-correction and monitoring, close supervision, increased rates of praise, error correction and feedback, clear classroom rules, and collaboration between school and home (Conroy et al. 2009; Conroy, Stichter, Daunic, & Haydon, 2008). Despite the strengths of the individual features of such a system, Conroy et al. (2009) admit a lack of empirical evidence supporting the creation and use of this ecological approach.

A review of the literature reveals a continuing need to delineate clearly what is known from what is unknown when working with young students with challenging behavior attributable to their disability. Several empirically based studies provide a descriptive review of known positive behavioral interventions with young students who demonstrate challenging behaviors (e.g., Conroy, et al. 2005; Schoenfeld, & Janney, 2008).

A search of the What Works Clearinghouse, first established in 2002 by the U.S. Department of Education's Institute of Education Sciences as a central source of scientific evidence of what works in education, yielded some useful outcome data. This review focused on interventions for students with special needs or for those classified using the categories identified in the Individuals with Disabilities Education and Improvement Act of 2004. Further search term refinement focusing on students with learning disabilities, children with disabilities, and children classified with an emotional disturbance, resulted in 30 reports. The search term student behavior yielded 19 interventions examining the evidence for the effectiveness of programs, curricula, and practices whose purpose is to foster positive behavioral outcomes. Nine studies addressed behavior, two focused on cognition, two on emotional/internal behavior, four on external behavior, one on functional abilities, five on general academic achievement, ten on knowledge, attitudes, and values, one on reading achievement, four on social outcomes, and two

on social-emotional development. None of the interventions examined in these studies addressing behavior used any aspect of music.

As a mandate of the NCLB, all teachers must use only EBPs in the classroom. Defining criteria used in determining EBPs in special education is complicated by issues of extreme variability of research participants, overrepresentation of minorities and English Language Learners, and low population numbers for some disabilities (Odom et al., 2005). Despite the lack of generalized consensus among researchers as to which characteristics define an EBP, they use general indicators to gauge commonalities and determine whether a practice can be considered an EBP (Gersten, Fuchs, Compton, & Coyne, 2005; Regan & Michaud, 2011).

Regan et al. (2011) report the following six practices as having adequate empirical evidence supported through repeated replications with consistent results: (a) FBA, (b) BIP, (c) positive reinforcement and consequences, (d) self-management/self-monitoring, routines, (e) structure and rules, and (f) the creation of safe and positive environments. The Individuals with Disabilities Education Act requires the use of FBA for students with EBD. Conducting an FBA requires a team to collect observational data as well as examine student records, interviews, anecdotal records, and surveys. The objective of an FBA is to uncover the function(s) of a behavior to provide data for use in the development of a BIP designed to encourage appropriate behavior and reduce undesirable behavior (Scott et al., 2004).

The second practice, the BIP, rests on the hypotheses generated from the FBA; it is a process for designing interventions to extinguish maladaptive behaviors and replace them with socially accepted alternate behavioral responses (Polloway, Patton, Serna, Bailey, 2013). The third practice, positive reinforcement and consequences, requires teachers to provide both verbal and nonverbal positive reinforcers to students to strengthen desirable student behaviors. An

example of a positive verbal reinforcer is when a teacher says, "I like the way Mary quietly got up, slid her chair under her desk, and walked to the door to line up for lunch." The use of stickers or behavior bucks in classroom token economies is an example of a nonverbal positive reinforcer. The uses of proactive strategies, such as posting classroom rules, and using higher rates of praise, are examples of ways teachers can implement positive reinforcement to increase adaptive student behavior for students with EBD (Heward, 2013; Sugai et al., 2010).

The fourth principle is self-management/self-monitoring. Here, the objective is to shift control of behavior and behavioral interventions from the teacher to the student. An example using this principle is having a student track his or her own behavior, collecting data indicating progress made in decreasing out of seat behavior or increasing on-task behavior. This method encourages the student to take ownership of his or her targeted behavior (Mooney, Ryan, Uhing, Reid, & Epstein, 2005).

The fifth principle is routine, structure, and rules. To minimize confusion, create predictability, and foster environments in which students with EBD can experience success, educators must set clear, specific, observable, measurable, and positive rules – and not too many of them (Oliver & Reschly, 2007). The sixth principle, creating safe and positive environments for all students, is particularly beneficial for students with EBD. Functioning as universal supports practiced throughout the school, adherence to this principle instills feelings of belonging and school attachment, encourages open communication, and recognizes adaptive behavior. This principle is operationalized through projecting high academic expectations, creating consistent and predictable classroom management, strengthening parent-teacher relationships, developing democratic classrooms, and promoting good character and citizenship (Cook, Tankersley, & Landrum, 2009).

The professional literature continues to call for development and replication of research-based interventions that will result in effective interventions, leading to improved education and life outcomes for students with EBD (Cook & Odom, 2013; Regan & Michaud, 2011; Ryan & Chionnaith, 2006).

Efficacies of Music Therapy

Music therapy has been shown to be an effective approach for many individuals, ranging from premature infants in neonatal intensive care units to senior adults in hospice care, to individuals with psychopathology or physical problems often resulting from trauma. Music provides an alternative environmental modification as a nonverbal avenue of treatment. The literature is vast and rich with evidence of the positive and sometimes enduring effects that music therapy offers in addressing the emotional, cognitive, physical, and social needs of individuals with various intellectual or physical disabilities (American Music Therapy Association, 2013; Goldbeck, & Ellerkamp, 2012; Perry, 2006).

In a randomized controlled trial of multimodal music therapy for children with anxiety disorders, children who were exposed to a combination of music therapy (i.e., three two-minute sessions of individual music therapy) plus cognitive-based therapy and nine 100-minute sessions of group music therapy showed significant improvements in their levels of anxiety over those who did not receive the treatment (Goldbeck, & Ellerkamp, 2012). Another study on the efficacy of music therapy in controlling anxiety among undergraduate students had similar results (Elliott, Polman, & McGregor, 2011). Related to these findings, Simpson, & Keen (2011) reported increase in the number of empirical studies investigating the use of music as an intervention for children with autism over the past two decades. Nevertheless, a lack of evidence concerning the efficacy of music as an intervention with children with autism has prompted the need for further

research on the merits of music as a means to facilitate development of behavior, social, and communication skills.

Practitioners have used listening to music to help individuals with autism learn about emotions. A study involving students with autism used background music to encode and decode teaching four emotions: sadness, happiness, fear, and anger. Participants sang songs composed specifically about each chosen emotion. The study essentially focused on comparing student learning under four preselected conditions. Groups one and two were control groups without any treatment, while groups three and four were given music as an intervention. In group one, there was no contact control, meaning that emotions were not specifically taught to participants with the use of an intervention. In group two, emotions were taught to participants using specific verbal prompts within a curriculum designed for teaching children with autism. In group three, piano improvisations, structured to represent four specific emotions, were played as background music while verbal instructions teaching emotions was conducted. In group four, songs with lyrics were used to teach the four emotions. Additionally, lyrics were sung by participants and teachers. Experimental controls included pre- and post-testing of the children's ability to accurately identify the emotion in each condition. Results from an Analysis of Covariance (ANCOVA) revealed the condition using background music was the most effective. Although findings indicated that all of the groups demonstrated improved understanding of all four emotions, the students' understanding of the four emotions was statistically significantly better through the use of background music compared to the other three conditions (Katagiri, 2009). Working with young children with autism, Kim, Wigram and Gold (2009) discovered study participants reported increased feelings of happiness and joy and were observed initiating and engaging in activities more often when improvisational music therapy was used during sessions

compared to sessions without the use of music. In this study, students randomly assigned to the group using music therapy were also more compliant and positive in response to researcher requests compared to students in sessions where music therapy was absent.

In an exploratory study measuring the motivational, emotional, and interpersonal interactions among young children with autism, researchers compared the effects of improvisational music therapy sessions to those of toy play sessions. Using a single-subject design with a sample size of ten, subjects participated in half-hour sessions over 12 continuous weeks. Researchers observed targeted behaviors, defined them, and collected data to determine baselines for participants. The researchers recorded and coded participant responsiveness to both settings for analysis. They found significant effects for several measured behaviors when using improvisational music therapy, including compliant response, joy behavior, emotional synchronicity, initiation of engagement by each subject, and initiation of interaction by the therapist. Researchers defined the emotional component 'joy' as "the child's joyful facial expression: joy refers to the event when the child either smiles (facial expression only), or laughs (facial expression with vocal sound) during the interaction with the therapist" (Kim, et al., 2009, p. 395). The results of the study indicated the children were more cooperative and displayed increased levels of interactive behavior during sessions with music therapy (Kim, Wigram, & Gold, 2009).

In another study, researchers substantiated claims of music facilitating blood pressure reduction from stress and improving quality of life. Participants received challenging math problems to solve within a short period. Then they were separated into one of three experimental groups to listen to a particular genre of music -- pop, jazz, classical -- or a no music control group. Researchers found participants listening to classical music experienced significantly

lower blood-pressure readings after completing the problem than did other groups (Chafin, Roy, Gerin, & Christenfeld, 2004). Similarly, in another study working with adult participants, researchers discovered that rhythmic movement while participating in music therapy correlated with increased quality of life conditions such as overall health, lower blood pressure, and improved upper body muscle strength (Jeon, Kim, & Yoo, 2009).

Similar successes have been achieved using music therapy with individuals with brain injury who suffer from anxiety and depression. In a 20-week observational study, researchers exposed participants with traumatic brain injury to individual sessions of weekly, one-hour music sessions divided into two 30-minute periods. Researchers divided participants into two groups: group A (receptive therapy) was exposed to sessions of listening to music, while group B (active therapy) was involved with playing an instrument. Researchers collected before and after treatment data, discovering participants' mood in both groups improved from the first session and continued to improve throughout the remainder of the study. Researchers measured 'mood' by using a patient-scored scale commonly used with pediatric patients. Findings further indicated participants in group B experienced reduced levels of depression and anxiety by the end of the study (Guetin, Soua, Voiriot, Picot, & Herisson, 2009).

Hitchen, Magee, and Soeterik (2010) reported multiple beneficial aspects of music therapy as an intervention for individuals with neurobehavioral disorders. These benefits included increased levels of participation, completion of functional type tasks, and increased levels of verbal communication. Participants also experienced fewer challenging behavioral occurrences while performing measured functional tasks. These findings suggest music therapy may be useful in reducing anxiety and agitation while increasing desirable behaviors in individuals with neurobehavioral disorders. The researchers indicated the need for additional

research into the efficacy of using music therapy as an intervention with individuals with neurobehavioral disorders, possibly as a de-escalation measure (Hitchen, Magee, & Soeterik, 2010).

Music therapy also has been shown to have efficacy for premature infants who have difficulties with transition to oral feeding due to neurologic immaturity. This is important as the incidence of premature births in the United States is increasing, as are related medical costs. In one study, researchers incorporated music therapy into daily routines for mothers of premature infants for one hour three times per week. In this randomized control study, mothers exposed to the independent variable (music) were more successful in breastfeeding than those in the control group (Vianna, Barbosam, Carvalhaes, & Cunha, 2011).

Two similar studies investigating the influence of listening to music on increasing the learning rate of non-nutritive sucking reflex of infants born prematurely, researchers found that listening to music had a positive effect on sucking frequency, duration, and endurance rates. This is significant as proficiency for nippling among premature infants leads to earlier hospital discharges (Standley, 2012; Standley, 2000).

In two randomized controlled trials in China, music therapy reduced pain scores among female breast cancer patients after radical mastectomy and anxiety levels among post-chemotherapy patients. Researchers created three randomized groups to study the effects of music therapy on participants. Group A participated in one-hour sessions, Group B received 30-minutes of verbal guided relaxation techniques, and Group C received traditional care. Researchers collected data on pain levels among participants at baseline and, again, during three post-tests. They discovered music therapy was instrumental in reducing both pain and anxiety levels (Li et al., 2011; Lin, Hsieh, Hsu, Fetzer, & Hsu, 2011).

In a study of the effect of music on peer awareness in preschool age children with developmental disabilities, researchers used a within-subjects repeated measures design with nine developmentally disabled children between the ages of two and six. The children participated in several group sessions lead by the researcher and several research assistants. During each session of music and elements of play activity, researchers focused on peer awareness. They collected data representing each child's altering and sustained attention toward peers and found the children were able to maintain attention toward peers longer, and their attention alternating among peers increased during times when music was incorporated (Sussman, 2009).

In a pilot study of the effects of music on group participation skills of preschool children with visual impairments, researchers focused on four behaviors considered important for student success in classroom environments: (a) following one-step directions, (b) remaining seated, (c) facing a speaker, and (d) manipulating objects according to their function. Participants were between the ages of four and six years old with a diagnosed disability of a visual impairment. Using a within-subjects repeated measures design, researchers developed two 30-minute small group periods of instruction designed to extend over a four-week period. The first period was music-based, while the second was play-based and devoid of any music. At the conclusion of their study, researchers found a positive, statistically significant result for music-based instruction and attention behavior, compared to play-based instruction (Robb, 2003).

In an international study investigating the effect of music on communication improvement in children with developmental disabilities, 40 students between the ages of seven and twelve from Greece, France, Germany, Cyprus, and Italy participated. Developmental disabilities included Down syndrome, Fragile X syndrome, and Autism Spectrum disorders. The

students were randomly assigned to an experimental group that participated in music therapy activities or a control group that involved discussion, playing, or watching television. Sixty-minute group sessions were conducted for both groups and repeated five times over a two-month period. Using a State-Trait Anxiety Inventory Scale (STAIC) for measurement of state and trait anxiety, researchers learned that music therapy appears to help calm young children with developmental disorders and may lead to significant improvements in their psychological and physical wellbeing. 'Calmness' was measured using a three-point self-report scale with or without the aid of a parent (Krikeli, Michailidis, & Klavdianou, 2010).

Conclusions

Supporting students with EBD through early identification and use of EBPs effective in educational settings is essential in helping this population achieve increased measures of quality of life. The literature indicated that even though there are research-based interventions not as yet distinguished as EBP, not all students respond equally to them. As such, there is a continuing need to identify interventions effective in assisting students with EBD to reduce non-productive disruptive behavior and increase time-on-task (Cook & Odom, 2013).

Among the strategies and interventions developed for use with students with EBD, Regan and Michaud (2011) supported only six best practices in either self-contained or general education classrooms: (a) FBA, (b) BIP, (c) positive reinforcement and consequences, (d) self-management/self-monitoring, routines, (e) structure and rules, and (f) the creation of safe and positive environments. They also endorse the continued efforts of practitioners to evaluate these interventions for efficacy, reliability, and validity through empirical research studies.

The literature continues to highlight the gap in knowledge concerning development of research-based evidence and EPBs for educating students with EBD. The power of music

therapy as an intervention to affect physical and emotional realms, such as state and trait anxiety, as well as observable behavior from premature babies to adults, is well established and discussed in the literature. State anxiety is defined as being fearful, nervous, or experiencing discomfort when presented with different situations perceived as dangerous. State anxiety applies to how individuals feel when they first perceive a threat and it is a temporary condition. Trait anxiety is a feeling of stress, worry, or being uncomfortable on a daily basis. An example of this is when a child feels anxious about going to school most of the time (Spielberger & Sydeman, 1994).

In summary, many qualitative and quantitative studies have been conducted with various components of music therapy among numerous, varied populations. In general, they support the notion that music as an intervention may help children with EBD in increasing their abilities to stay on task and reduce disruptive behavior.

Single-Case Designs for Educational Research

One of the challenges in both general and special education research stems from conducting research in an ethical manner. In an effort to cause no harm, empirical studies involving students are done in the natural environment such as classroom, institution, or home setting with the researcher systematically presenting and withdrawing an independent variable while holding other variables constant and measuring changes in the dependent variable, maintaining experimental control (Kennedy, 2005). The quest is to seek correlated events, which seem to occur in a pattern. Single-case, often referred to as single subject designs, can be performed using an individual student, classroom, or even school without requiring the need for "control" or "contrast" groups as a comparison since the single-case serves as the unit of comparison (Kennedy, 2005).

The purpose of the following section is to explore the research methodology of single-case designs for educational research. The section will include a discussion on the background of single-case research designs, the utility of single-case designs, and determination of which design is more appropriate to use for various research interests. The discussion will also address the strengths and weaknesses of various single-case designs.

History of Single-Case Designs

A diverse collection of scholars in the early twentieth century promoted the use of experimental methods to help understand classroom educational practices. Notable among them are John Dewey, John B. Watson, George Herbert Mead, and B. F. Skinner. These individuals, among others, recognized and practiced systematic methods leading to what are now common practices in American education. Each scholar recognized research is necessary to allow education to rise above the politics, fads, and personal biases dominating educational policy making in U.S. society (Kennedy, 2005). Many of what educators and the general public now consider common practices in schools, such as peer-mediated instruction, curriculum-based assessment, token economies, and inclusive education, emerged from the educational research of previous decades. The practice of studying a small number of cases was common in experiments performed by Pavlov (1928) and, later, B.F. Skinner (1966b). Individually, they discovered important principles in the field of learning by studying individual organisms.

More than 40 years ago, Donald M. Baer, along with several of his colleagues, provided an overview regarding the status of the field of behavior analysis, leading to the development of single-case designs. They posited that the analysis of individual behavior tends toward being observable and measurable and, therefore, can be scientifically studied despite limitations with variable precision, power, and elegance (Baer, Wolf, & Risley, 1968). Other researchers, such as

Kennedy (2005), maintained that single-case designs can show experimental control within a single subject or set of subjects. Single-case designs repeatedly have demonstrated experimental control using a single participant as both the control and experimental participant. Unlike case histories or ethno-graphic studies, single-case designs demonstrate a rigorous degree of experimental control as they hold all conditions constant except for the independent variable, which is systematically introduced and withdrawn to study its effects on behavior (Horner et al., 2005).

A number of underlying assumptions associated with the epistemological basis of single-case designs are found in the origin of behavior analysis. First, single-case design is idiographic, meaning that the research used to approach the subject matter is derived from an understanding of how an individual behaves rather than by describing mathematical averages of groups of individuals (Kennedy, 2005; Sealander, 2003; Odom et al., 2005). Second, the independent variables used in a single-case design study must be physical events, meaning they must have material existence (Kennedy, 2005). This is necessary as an intervention must be operationalized or defined in concrete terms that can be observed and either agreed on as occurring or not occurring (Kennedy, 2005; O'Neill, McDonnell, Billingsley, & Jenson, 2011). Third, an inductive framework to understanding human behavior is the most productive strategy to use (Kennedy, 2005; O'Neill, McDonnell, Billingsley, & Jenson, 2011). Rather than using an a priori theory of human behavior and, then, designing experiments to test the accuracy of the theory, single-case designs rely on using a behavior-analytic approach commonly referred to as inductive research or grounded theory. Knowledge is developed incrementally with each experiment, discovering and adding knowledge to previous experiments (Keller, 2002; Kennedy, 2005; O'Neill, McDonnell, Billingsley, & Jenson, 2011; Odom et al., 2005; Sealander, 2003).

Although the field of behavior analysis is approximately only a half-century old, behavioral analysis and single-case designs are recognized by national organizations such as the National Association of School Psychologists (NASP) and the American Psychological Association (APA).

Single-Case Designs

Several variations of single-case research designs offer researchers greater flexibility in choosing the method best suited for their study. Single-case designs are experimental rather than descriptive or correlational (Horner et al., 2005). The essential components of a quality single-case design include a description of setting and participants, dependent variable(s), an independent variable, baseline, demonstrations of internal and external validity, and social validity (Horner et al., 2005; Kennedy, 2005). The description of participants and setting should include adequate detail to allow future researchers to replicate the study using similar individuals and settings. Both the dependent and independent variable must be observable and measurable with enough detail to allow future researchers to replicate with a high degree of accuracy. The baseline indicator is a phase of repeated measurement of a dependent variable over a sufficient time to indicate a reliable pattern, which will later be used to estimate future performance. A description of baseline conditions must be detailed sufficiently to allow for future replication. The design should include a minimum of three iterations at different times, demonstrating experimental effect and indicating controls used to limit threats or bias to internal validity. External validity is demonstrated by repeating the intervention across settings, participants, or material used in the experiment. Last, the dependent variable is shown to have social validity (Horner et al., 2005; Kennedy, 2005; O'Neill, McDonnell, Billingsley, & Jenson, 2011).

The discussion will now focus on how to determine which type of method is most useful overall in conducting an empirical study involving individuals with EBD. This section will describe the various research methods used in single-case experimental research designs used in education and discuss the advantages and disadvantages of each.

A-B Designs. Single-case designs are used in studies to demonstrate experimental control over targeted behavior of a single individual. This individual participant serves both as the control and experimental subject unlike group comparison studies which use many individuals in an experimental and control group. In A-B designs, repeated sampling occurs over time to observe and measure patterns of behavior in both baseline and intervention phases (Kennedy, 2005; O'Neill, et al. 2011). Since A-B single-case designs are limited to documenting change at a single point in time, they are vulnerable to threats to internal validity due to maturation, measurement error or historical events (O'Neill, et al. 2011). The most basic form of all single-case designs, the A-B arrangement, defines the baseline phase as (A) and the intervention phase as (B). In an A-B design, the researcher collects data on the dependent variable (DV) during the A stage long enough to detect a pattern before introducing the independent variable (IV) in stage B. Similarly, the researcher collects data during stage B to detect a reliable pattern.

Using the fundamental A-B design, the participant's behavior is repeatedly observed and measured during both baseline phase, referred to as A, and during the intervention or treatment phase, referred to as B. While there are a number of other more complex and complicated designs such A-B-A, A-B-A-B, repeated acquisition, and multiple baseline designs, they are all based on extensions of the A-B feature (Kazdin, 1982; Kennedy, 2005; Sealander, 2003). Because of the absence of an intervention during baseline, the researcher seeks to demonstrate a relationship between what differences occur between phase A and B. If a change in the

dependent variable occurs during the intervention, then a relationship between the independent and dependent variable is shown to have occurred.

An example of a case study using an A-B design is provided by Campbell and Skinner (2004). They conducted a study involving a classroom of 30 sixth-grade students whose teacher was concerned about the excessive amount of time that it took transitioning between activities (e.g., coming and going from recess and lunch). During the A phase the number of seconds required for these transitions was recorded, and a daily average was calculated. During the intervention phase, the research staff worked with the teacher to implement the Timely Transitions Game, a procedure in which the class could qualify for steps toward rewards such as a class movie or a popcorn party for each transition that was accomplished in less time than a pre-specified criterion number of seconds. The researchers demonstrated that there was a clear and consistent reduction in the amount of transition time during the B phase.

There are several factors which may influence the internal validity of an A-B design which must be considered when assessing threats to validity. Objectivity of data is concerned with the possibility that the data being reported exceeds the research findings. Frequency and duration of data collected may not be adequate during both baseline and treatment phases. Stability of data in order to demonstrate a stable pattern of performance over a period of time. Immediacy and degree of effect produced by an intervention when it is first implemented. Lastly, is the design capable of being replicated in order to demonstrate similar effects (Kennedy, 2005; O'Neil, et al., 2011).

A common variation has the researcher then withdraw the IV, thereby reverting to stage A in which, once again, data is collected on the DV over a period long enough to detect a reliable pattern. In an A-B-A-B design, the researcher reintroduces the IV in another series of

interventions, collecting data is again over a period to once again show a pattern. If the researcher observes the DV to co-vary with the introduction and absence of the IV, then a high degree of experimental control has been established.

Many researchers prefer to use the A-B-A-B design for two reasons. First, it creates two separate occurrences of replication. If the IV has an effect on the DV upon two introductions, the researcher has a higher degree of confidence that the IV is responsible for the change. A second reason to prefer the A-B-A-B design is the applied nature of educational research. Applied behavioral analysis focuses on applications of IVs intended to be beneficial to participants. If an intervention improves a problematic situation, then, ethically, it is preferable to choose a research design that enables the participant to receive the beneficial IV a second time (Kennedy, 2005; Sealander, 2003).

Another variation is the B-A-B design, where a researcher may wish to conduct an experiment in a setting where the intervention may already be in place. In a study by Robinson, Newby, and Ganzell (1981), the researchers started their observation of behavior of a token economy already in place. Researchers withdrew the token economy as the A phase and, then, reintroduced it during phase B. They observed a correlation between withdrawing and then reintroducing the IV existed relative to the token economy.

A final variation, the A-B-C-B design, adds an additional condition so the researcher can see how a second IV element may influence behavior. For example, in a typical A-B-A-B design "A" represents the baseline condition while "B" represents the intervention phase. A comparison of the intervention phase to the baseline phase allows a researcher to contrast the result of a single intervention to the baseline. With the addition of a "C" phase, a researcher may choose to perform a comparative analysis by using a different intervention. In this case, the participant is

the control and experimental subject, as well as a contract participant with the addition of the "C" phase.

Strengths and limitations. A-B-A designs are the most common single-case experimental designs with high internal validity (Slavin, 1992; Kennedy, 2005). One of the main strengths of an A-B-A-B design is that it allows researchers to compare two conditions within a single subject and allows for more repeats if necessary, such as A-B-A-B-A-B. As previously mentioned, a B-A-B design can demonstrate the effects of a previously established intervention. There are three limitations for this design type. First, if a behavior is not reversible, an A-B-A-B design would not be appropriate. Second, this design is not acceptable if the reversal of the behavior to baseline levels raises ethical concerns or risks the health and safety of other persons.

Multielement designs. When a large number of conditions need to be compared or multiple repeats of a smaller number of conditions are necessary, then researchers may use multielement designs (Kennedy, 2005; Sealander, 2003). Multielement designs make the comparison of multiple conditions feasible, which is a limitation of A-B-A-B designs. In its most elementary level, a multielement design could examine the effects of two conditions, baseline (A) and intervention (B), on behavior. Then, a researcher would then be able to alternate between conditions A and B from session to session, collecting data to determine whether behavior varies under each of the two conditions. A variant of the multielement design is Alternating Treatments Design; after a baseline period, two treatments (A and B) are administered, alternating with each other, while the researcher observes their effects on one behavior (Barlow & Hayes, 1979).

Strengths and limitations. Multielement designs allow researchers to investigate and analyze two or more experimental conditions using a single participant. There are two limitations of this design. The first limitation involves behavioral reversibility. Essentially, if a change in

behavior is produced, and an IV cannot be reversed by withdrawing the intervention, then multielement designs are inappropriate. Secondly, multielement designs present the potential for interaction effects, where the effect on the observed behavior during baseline or IV condition is affected by other conditions.

Multiple baseline designs. In some studies, the researcher may choose not to withdraw the IV for a variety of reasons, such as it when would be considered unethical, or when it is impossible to do, as in a case where the targeted behavior once learned would not be able to return to the baseline condition during a withdrawal phase. In these cases, a multiple baseline design may be appropriate.

Strengths and limitations. Multiple baseline designs, undoubtedly, are the most preferred type of single-case research design, due, in part, to the inherent flexibility in the timing of introducing IVs and the ease of adaptability to applied settings. As previously mentioned, multiple baseline designs are the design of choice in situations in which behavior cannot be reversed or when ethical concerns make removal of the intervention unacceptable. Multiple baseline designs, however, are limited to demonstrating the general effects of an IV on behavior (Kennedy, 2005; O'Neill et al., 2011; Sealander, 2003).

Summary

This chapter has provided an overview of the history, cause, characteristics, and descriptions of academic and social skill deficits of children with EBD. The literature recognizes the existence of interventions and EBPs designed to extinguish and replace undesirable behavior with socially acceptable behavior in students with EBD. The literature also indicates that students with EBD, generally, are several grade levels below their non-disabled peers and comorbidity of a SLD is common.

Numerous studies have investigated music as an intervention, demonstrating the positive outcomes of music therapy in decreasing disruptive behaviors, reducing anxiety levels, shaping targeted behaviors, and improving self-esteem among various populations, including those with EBD (Hillier, Greher, Poto, & Dougherty, 2011; Hong et al., 1998). Layman, Hussey, and Laing (2002) have used music therapy successfully in improving social functioning, social awareness, and cooperation when working with children with EBD who demonstrated high levels of impulsivity and limited ability to self-regulate. Over the past two decades, there has been increased interest in the use of music as an intervention for students with autism, primarily because of the lack of empirical studies in this field and the demand for examining effective interventions for this population. Simpson and Keen (2011) reported that music intervention has been used to facilitate social, behavior, and communication skills and they have called for further research.

This chapter ended by presenting the justification for single-case designs, showing the rigor of the methodology when used in research in educational settings (Freeman & Sugai, 2013; Horner et al., 2005; Kennedy, 2005; Odom et al., 2005; O'Neill et al., 2011; Sealander, 2003). The power of using the A-B single-case design lies in the objective nature of the data collected, coupled with repeated measurements occurring throughout both baseline and treatment phases. It also includes the immediacy and degree of intervention effects, and ability for replication across a number of individual cases, all help rule out alternative explanations for the results (Kennedy, 2005; O'Neil, et al., 2011). Using an A-B design is also preferable in this study as it considers the ethical concern associated with a withdrawal phase for an intervention, which may produce positive results for the participants. Relying on the strengths of single-case designs for

educational research, this review of the literature verified the importance of investigating listening to music as an intervention to address the behavioral needs of children with EBD.

CHAPTER THREE: METHOD

Based on the findings of the literature review, the researcher opted to use a multiple baseline across subjects, settings, and behavior design that can be implemented by the teacher in the special education classroom. The study is designed to apply what is known about the beneficial properties of music in mitigating anxiety and targeted observable, measurable disruptive or unproductive behaviors of students with EBD in classroom environments to determine whether listening to music exerts a positive effect on reducing those behaviors (Hong et al. 1998).

What follows is an introduction to the research questions, characteristics of the setting, and identification of participants. It also offers a discussion of the materials used for the study, dependent measures, experimental procedures, study design, data analysis procedures, inter-observer agreement, and treatment fidelity.

Research Questions

The research questions examined in this study are:

1. To what extent does listening to music decrease talk-outs in children with EBD who exhibit talking-out behavior in a school setting? Here talking out is operationally defined as talking-out or yelling without teacher permission.
2. To what extent does listening to music decrease off-task behaviors in children with EBD behaviors in a school setting? "Off-task" is operationally defined as visual attention not focused on a single target or task for periods of at least 10 seconds or more. For example, when a student is expected to be directing their attention to a classroom teacher, instructional material, or instructional activity but eye gaze is

oriented elsewhere, the student is considered to be "off-task" (Ruff & Rothbart, 1996, p.110).

3. To what extend does listening to music decrease out-of-seat behavior in children with EBD who exhibit out-of-seat behavior in a school setting? Out-of-seat behavior is operationally defined as being out of one's seat without first receiving teacher permission.

Setting, Participants, Research Assistant, and Materials

The researcher designed this study to occur in a public school setting, the natural environment, with students identified with an EBD and who demonstrate EBD behaviors that interfere with their educational progress. Previous research indicating effective interventions for students with EBD found improvements in math and reading skills among students at risk for developing EBDs. However, the effects did not last once the interventions were withdrawn (Barton-Atwood, Wehby, & Falk, 2005; Lane, Little, Redding-Rhodes, Phillips, & Welsh, 2007). Accompanying math or reading difficulties, students with EBD are commonly unsuccessful with academic engagement and on-task behaviors (Bowman-Perrott, Greenwood, & Tapia, 2007). Specifically, behavior is frequently a concern for teachers of children with EBD, and previous research suggests interventions should seek to target behavioral and academic engagement during classroom subject activities (Landrum, Tankersley, & Kauffman, 2003).

Setting

The study took place in a public school classroom with multiple students in a rural school district in the Northeastern region of Oklahoma in the United States. In 2013, the school district served 3,555 students (48.3% White, 21.9% American Indian, 11.7% Hispanic, 2.1% Black, 0.3% Asian, 15.5% two or more races, 0.1% other races) from pre-kindergarten through twelfth

grade. Overall, 71.4% of the district's students qualified for free/reduced lunch and 73.6% of Tahlequah Middle School students qualified. The middle school serves 863 students in grades six through eight. The school received funds through Title I of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 6301 et seq.) to help at-risk students. The school houses two self-contained classrooms for children with disabilities. The five middle school students participating in the study attended school in one of these self-contained classrooms serving the needs of students with mild to moderate disabilities. Students in this special education classroom received services from the classroom special education teacher and one instructional assistant (i.e., a paraprofessional). At the time of the study, six students were receiving special education services in this classroom under the qualifying category of ED, but one student declined to participate in the study.

All students in this class received their academic instruction with their classmates during the same class period in the same classroom. All students mainstreamed to classes offered in the general education environment participating with non-disabled students in music, physical education, library, computer class, and art several times a week. The special education teacher taught math and reading as well as supervising independent activities and assignments.

The five students in the study were taught math using the Holt McDougal Mathematics Common Core Solutions, a Grade 6 textbook (Houghton Mifflin Harcourt School Publishers, 2012). Table 1 lists the students' current performance using the Wide Range Achievement Test 4 (WRAT 4); they were performing at grade equivalencies ranging from second through eighth grade. The math instructional period began daily at 8:15 A.M. lasting 45 minutes. The classroom teacher began whole group instruction by lecturing 15-30 minutes from the front of the classroom using a Smart Board. The classroom teacher began the lesson with a review of the

previous day's lesson followed by new material while students took notes while seated at their desks. After providing several examples the teacher then handed out a daily worksheet to each student for independent practice which lasted 15-30 minutes. The independent skill practice was identical for all six students who were seated at their individual desks. This always involved the completion of a worksheet associated with the lesson being taught that day.

The researcher selected three students during each math session and used a rotational method constructed of three five-minute time intervals. On day one, student one was observed for the first five-minute interval, student two was observed for the second five-minute interval, and student three was observed during the last five-minute interval. This way, the researcher could focus attention solely on only one student at a time. The researcher rotated student observations during day two by observing student one during the last time interval, student two during the first time interval, and student three during the middle time interval. On day three, the researcher rotated his observations again so he could observe students during either a beginning, middle, or end interval, completing an observational cycle where he had observed each during a different period over a three-day cycle. This was done in order to determine whether or not patterns of behavior were discernable and associated with the length of instruction.

The researcher repeated the observational cycle according to the schedule for all subsequent sessions in both baseline and treatment phases. Students were seated at their desks, independently completing their task with the researcher observing them from the side or rear of the classroom. The principal investigator (PI) and the research assistant (RA) were together in the classroom during reliability assessments. Otherwise, the PI conducted observations during daily math instruction while the RA collected observational data during reading instruction.

Immediately following math instruction, students received instruction on reading. The reading class was scheduled for 45 minutes and focused on reading the novel, Percy Jackson and Olympians, The Lightening Thief by Rick Riordan. The class began each day with the students seated at their desks with a copy of the paperback novel. Students would follow along in their book while listening to a 20- to 30-minute recording of a chapter being read using a prerecorded tape and tape player. Following the reading, the teacher would discuss the chapter and activity for another five minutes before each student individually completed an assignment while seated at their desk. An individual paper-based assignment was then handed to each student by the teacher. The activity for the students involved completion of a written assignment focused on the material in the chapter of the day. Some examples of worksheets used are crossword puzzle worksheets with word banks, worksheets working with root words, and worksheets matching character traits, predictions, and quests. All of these activities are based in reading standards for the individual student using the associated novel.

Table 1 lists the students' individual reading composite levels as measured by the Wide Range Achievement Test 4 (WRAT-4). Data collection during both baseline and treatment phases occurred during a rotating five-minute period when students were working independently completing a worksheet. The data collection procedures were identical to those the researcher used during math instruction.

Participants

The researcher recruited participants with the assistance of the Director of Special Services for the Tahlequah School District, in Tahlequah, Oklahoma. Before recruitment, the researcher obtained approval from the Northern Arizona University (NAU) Institutional Review Board (IRB). After IRB approval, the researcher selected students meeting the eligibility criteria

to participate through a purposive sample involving a recommendation by their special education teacher.

The special education classroom teacher identified five students as having frequent behavior problems, and for this reason they were selected for participation. The researcher interviewed the school district's special services director and the special education teacher to confirm criteria for inclusion in this study. After the interviews were completed, the researcher and research assistant conducted direct observations of the students to confirm demonstrations of targeted behavior in the classroom setting and identify individually targeted behaviors to be observed and measured throughout the study.

Prior to the beginning of the study, the researcher contacted the parent/guardians and students to obtain informed consent for participation in this study (Appendices A and B). Table 1 provides demographic information for each student. The next sections provide detailed information on each student in a narrative form, addressing each student's academic and behavior history. The descriptions provide specific information regarding individual behavioral challenges such as how long it usually takes for each student to engage in independent seat-work time and behaviors to look for once the student begins to be off-task.

Susan. Susan, a Caucasian female, was 11 years, 11 months old when the study began (see Table 1). Susan was in grade 6, in a cross-categorical self-contained class at the middle school. She was diagnosed as having an emotional disturbance and began receiving services at the beginning of third grade. According to teacher interviews, Susan is an only child and lives with her mother. The family moved often, but Susan has managed to remain in the same school district throughout most of her time in elementary school. At the beginning of the study, Susan's sixth grade math computation scores were at the eleventh month of the third grade level.

According to school records, a psychologist administered the Behavior Assessment System for Children (BASC) to Susan approximately two years ago. The results of this assessment indicated she is at clinically significant levels for hyperactivity, aggression, externalizing problems, anxiety, depression, internalizing problems, atypicality, withdrawal, and attention problems (see Table 1). The classroom teacher indicated Susan was on medication for anxiety and bipolar disorder. Susan participated in the reading setting of the study.

Allen. Allen, a Caucasian male was 12 years, 4 months old when the study began (see Table 1). Allen was in grade 6, in a cross-categorical self-contained class at the middle school. Allen was diagnosed with an emotional disability in grade 2 and has remained continuously in a self-contained classroom since then. Allen lives with his aunt, who works at the school as a custodian. Allen's math computation scores are at the seventh month of the eighth grade. School recorders indicate a psychologist administered the BASC to Allen two years ago. The assessment indicated Allen is clinically significant for hyperactivity, aggression, externalizing problems, anxiety, depression, atypicality, attention problems, and social skills (see Table 1). Allen participated in the math setting of the study.

Craig. Craig, a Native American male was 11 years, 2 months old when the study began (see Table 1). At the time of the study, Craig was in grade 6, in a cross-categorical self-contained class at the middle school. He was diagnosed with an emotional disability at the end of kindergarten and has remained in a self-contained class since then. At the time of the study, Craig was living with foster-parents and had experienced a great deal of family disruption. Craig's math computation scores are at the seventh month of grade 2. School records revealed a psychologist administered the BASC three years ago. The assessment indicated Craig is clinically significant for hyperactivity, aggression, externalizing problems, depression,

somatization, attention problems, and social skills (see Table 1). Craig participated in the reading setting of the study.

Rowan. Rowan, a Caucasian, was 12 years and 6 months old when the study began (see Table 1). Rowan was in grade 7, in a cross-categorical self-contained class at the middle school. He was diagnosed with an emotional disability early while in grade 1. According to teacher interviews, Rowan witnessed the death of his younger sister and father in a car accident when he was six years old and lived with his mother and paternal aunt. Rowan's math computation scores were at the seventh month of the fifth grade. School records revealed a psychologist administered the BASC three years ago to Rowan. The assessment indicated Rowan was clinically significant for hyperactivity, aggression, externalizing problems, somatization, attention problems, and social skills (see Table 1). Rowan participated in the math setting of the study.

Simon. Simon, a Caucasian was 12 years and 1 month old when the study began (see Table 1). Simon was in grade 6, in a cross-categorical self-contained class at the middle school. According to teacher interviews, Simon was victim of early childhood trauma type I and II by his mother and mother's boyfriend. School records revealed a psychologist administered the BASC one year ago to Simon. The assessment indicated Simon scores clinically significant for hyperactivity, aggression, externalizing problems, attention problems, behavioral symptoms index, and social skills (see Table 1). Simon participated in the math setting of the study.

Pre-intervention Behavioral Analysis

Each of the students participating in the study had previously completed a Behavior Assessment System for Children, Second Edition (BASC-2) (Reynolds & Kamphaus, 2004) to assist in identifying both strengths and weaknesses. The BASC-2 uses a multidimensional

method for organizing assessment using a triangulation method from the perspectives of the individual student, parent, and teacher. The current classroom teacher then confirmed the results of this assessment for each participant (see Table 1). This aided the researcher in identification of specific disruptive behaviors to target for data collection which were used throughout both phases of the study.

Table 1. Student Information

Student/ Gender	Age/ Grade	Race	IQ WPPSI-III Full Scale	Primary Disability	WRAT 4 Standard Score -Math -Reading	Time in General Education (%)	BASC Data * 1. Hyperactivity 2. Aggression 3. Externalizing Problems 4. Depression 5. Atypicality 6. Attention Problems 7. Behavioral Symptoms Index 8. Adaptive Skills
Susan Female	11-11 6th gr.	C	81	ED	89 76	20%	1. 99 2. 97 3. 98 4. 94 5. 97 6. 95 7. 98 8. 91
Allen Male	12-4 6th gr.	C	92	ED	78 112	20%	1. 87 2. 83 3. 95 4. 77 5. 93 6. 97 7. 90 8. 30
Craig Male	11-2 6th gr.	NA	79	ED	52 68	20%	1. 89 2. 79 3. 70 4. 60 5. 65 6. 94 7. 73 8. 24
Rowan Male	12-6 7th gr.	C	87	ED	64 92	20%	1. 99 2. 93 3. 89 4. 64 5. 62 6. 98 7. 72 8. 36
Simon Male	12-1 6th gr.	C	77	ED	51 60	30%	1. 97 2. 94 3. 67 4. 89 5. 75 6. 87 7. 93 8. 57

Note: Age in years-months; C = Caucasian; NA = Native American.

Teacher

The classroom teacher was a 55 year-old white female with a Bachelor of Arts degree in education and certification in teaching students with mild to moderate disabilities. This was her 18th year teaching students in special education in numerous settings to include self-contained, resource, and inclusion. She taught students in grades seven and eight in public schools in Tulsa, Oklahoma for five years before teaching at the middle school in Tahlequah, Oklahoma, where she has taught for the last 13 years. She is a recipient of the Tahlequah school district's Teacher of the Year award and district Special Education Distinguished Service Award. This was her first year teaching this particular group of students.

Paraprofessional

One paraprofessional worked fulltime assisting all students in the self-contained classroom at the middle school. Ben, a Caucasian, was 40 years old and has a Bachelor of Science degree in health sciences. Ben had ten years of experience working in classrooms with students with challenging behavior, all at the same middle school. He and the classroom teacher have been working together in this self-contained classroom for three years with students in grades seven and eight. Ben attended a 32-hour class for paraprofessionals provided by the district in 2012. He has no prior experience as a participant, research assistant, or researcher in any research studies.

Research Assistant

One RA participated throughout the study. Although she had no formal training working with students with disabilities, she grew up with an older brother diagnosed with EBD. She also had some experience working with individuals with disabilities while working as a RA at National Institute of Health in Bethesda, Maryland.

Training

Researchers sometimes perform pilot studies in advance of a major study or as a trial run to pre-test a research procedure or instrument (Polit, Beck, & Hunger, 2001). Similar to a pilot study, the primary researcher conducted a procedural study in preparation for the major research study. Even though such pre-studies may be of benefit, they are no guarantee of success in research studies. However, they may increase the likelihood of success by presenting opportunities for altering procedures or environments in preparation for the main study (Baker, 1994). They can provide an advance indication of weaknesses in a protocol before actually implementing a study. These weaknesses may include research protocols not being followed, inappropriate instruments, or procedures too complicated for the proposed study.

The researcher conducted the procedural study in a classroom environment under conditions closely resembling those planned for the main study. The study was conducted in a classroom in the Reading Center at the Broken Arrow Campus of Northeastern State University one month preceding the main research study. The classroom was organized with ten individual desks along with several medium sized tables with four chairs for student group work. There was a varied assortment of reading material for primary and secondary age students along with new contemporary textbooks for all subject areas from pre-k through high school. There were no other students except participants in the classroom during the procedural study.

The researcher and RA trained together refining and practicing observational methods, recording techniques for targeted behaviors, and in the operation of iPods for playing music selected for the study. Training procedures in observational method collection of data was conducted daily over a two-hour period for five days during the procedural study preceding the main study. As suggested by Gast (2010), the researcher and RA trained together to acceptable

levels of performance as determined by the researcher. The focus of training was on mastery of procedural fidelity and how to consistently identify and record instances of targeted behaviors to be studied.

The researcher and RA practiced data-collection procedures during the procedural study for thirty minutes each of the five days for inter-observer agreement measures, in order to achieve an acceptable agreement level of 85% or better which is discussed in detail later in this chapter. The researcher and RA conducted IOA recording sessions during the last two days of the procedural study for comparative use. Both the researcher and RA used identical data collection sheets to record targeted behaviors over the same five-minute period observing the same participant. IOA scores from these two sessions were 90% and 100% respectively. The training also included procedural aspects of maintaining confidentiality of data collected as well as how to maintain and access all materials and supplies used in the study. Other procedural issues addressed protocol on how to enter and exit a room causing the least distraction for the students and classroom teacher, as well as how to respond to problematic behaviors.

Preceding the study, the researcher arranged with the classroom teacher for accessibility to learning materials and space required for both the researcher and RA to conduct the study within the classroom. This also included ensuring ergonomically appropriate seating, low noise environment, adequate lighting, and minimal distractions. The researcher and classroom teacher also coordinated establishing a daily routine schedule when the students would be available for participation in all settings during which data collection would occur. Seating arrangements were discussed as well as academic content for both the math and reading settings when participants are to be observed.

The researcher and RA also discussed procedures on how to appropriately greet students and engage in respectful, meaningful conversations with the students designed to foster positive relations conducive to learning. The researcher and RA also established a routine for storage and use of all materials to include data-collection records and iPods. Procedures were developed to ensure all the iPod batteries were recharged daily and the music was queued to start at the beginning for each data collection session during the intervention phase. Two timers were used to record times during all observational periods.

The researcher and RA coordinated with the classroom teacher to determine appropriate seating for the researcher and RA in order to minimize any possible effect from their presence. The researcher and RA sat to the side in the rear of the classroom thus enabling unimpeded direct observation of all participants.

During baseline observation, the timer was set for five minutes during which time the researcher or RA directly observed one participant and recorded any of the three targeted behaviors by making a hash mark on the observation form in the column for recording that behavior. At the end of each day, the researcher collected the data-collection sheets and recorded the data for later use.

Conducting the procedural study was beneficial to the researcher and RA. First, the procedural study allowed both of them to practice collecting observable measurable data using a timer over several precise periods of time. An important result of this experience was a small but significant change to the format of the data collection sheet, improving data collection procedures.

Materials

The study used five iPods with ear buds and batteries, one for each of the five participants. One student elected to use his own earphones. The study used iPods and earbuds rather than a speaker as they allow selectivity of use, which is compatible with using a multiple baseline design. The iPods contained an eight-minute recording of Mozart's Sonata for two pianos in D major, K.448. This music selection has demonstrated efficacy in inducing the development of positive emotions in children with ADHD, epilepsy, and a range of other neurological disorders (Lin et al., 2011; Steele, Bass, & Crook, 1999; Thompson, Schellenberg, & Husain, 2001). The researcher used data collection sheets and a computer for recording and analyzing data.

Dependent and Independent Variables

Single-case designs focus on first demonstrating experimental control leading to demonstration of a functional relationship between systematic manipulations of an independent variable (IV). There are three dependent variables (DV) identified in this study which are observable and measurable. The three DVs are: (a) a student being out-of-seat without teacher permission (b) talking out and (c) looking away from working on a worksheet for a period of ten seconds or longer. There is no limitation on the number of variables that can be used in a study other than tractability (Kennedy, 2005). The IV is a singular event of experimental interest which in this study is listening to a selection of classical music for an eight minute segment of time in order to determine if there is a positive relationship between the IV and one or more of the three DVs.

The researcher defined and identified the three behaviors based on information provided by the classroom teacher. Disruptive behavior was identified and defined for each participant.

EBD behaviors can be externalized or internalized (Heward, 2013). Externalized behaviors can be grouped as aggressive which includes occurrences of either self-injury, injury to others, or property destruction. They can also be behaviors which are disruptive such as non-compliance, tantrums, task refusal, inappropriate vocalizations, hyperactivity, poor impulse control, and elopement (Paley et al., 2011). While each individual participating in the study exhibited varying levels of intensity and occurrences, they all shared similar definitions of observable and measurable behaviors, which interfered with their learning. Prior to beginning the study, the researcher and RA observed the students in the natural environment during five sessions during both math and reading instruction prior to collecting baseline data.

Experimental Procedures

Observational recording. The number of observational recording sessions depended on the individual student displaying the targeted behavior. Observations were conducted using an event recording data sheet with a rotating interval method for documenting each occurrence of three targeted behaviors. The observational period was five minutes per student and began when the teacher presented a worksheet to a student as the teacher identified that moment as the most likely time for participants to display disruptive behavior. Although there is no standard of time for an observational period, five minutes was selected based on the observational period used in a previous study using a multiple-baseline-across-students design to determine if there was a functional relationship between function-based behavior support and decreases in problem behavior and increases in academic engagement (March & Horner, 2002). The number of observations required to capture and measure the occurrence of the targeted behavior prior to the introduction of the intervention varied among participants. Minimally, it took at least three

observational sessions during baseline and five sessions during the observational treatment phase (O'Neill et al., 2011). The Event Record Sheet contains the observational code (Appendix D).

Dimensional Quantities of Behavior. Behavioral responses have multiple dimensions that are used to quantify or measure a response. Essentially there are five fundamental types used in measuring characteristics of a behavioral response. They are: Frequency or rate, duration, latency, interresponse time, and celeration (Kennedy, 2005). Frequency or rate counts of behavior are used most often and are defined as the number of occurrences of a behavioral response in a predetermined period of time. Duration is a measurement which allows for a temporal dimension of a response. It can be defined as the amount of time which elapses from the onset of a response to the end of the same response. Latency is the amount of time between the onset of a stimulus and the reaction occurrence of a response. Interresponse time is a measurement of time which occurs between occurrences of a response. An example of this would be the number of seconds between bites taken from an apple eaten during a meal. Celeration is a measurement which records the change in frequency of a response over a predetermined timeframe. It is the change in the average response time for a [illegible] period of time compared against another period of time. An example of this would be counting how many addition problems can be solved per second per minute.

The researcher used frequency in recording of targeted behaviors documenting the precise number of occurrences of behavior within a predetermined timeframe. Observers used the data-recording sheet (Appendix E) to collect data, using a frequency count during the specified period of five minutes. Frequency counts of behavior are the most common dimensional quantify and the most intuitive (Kennedy, 2005).

Assessment, pre-intervention. The researcher confirmed instances of disruptive behavior identified by the classroom teacher for each student before data collection occurred. Disruptive behavior generally is any behavior that interferes with or interrupts student learning. Behaviors observed included talk-outs, looking away from worksheet for 10 seconds or longer, and being out-of-seat.

Baseline. During baseline conditions, the researcher used accepted existing conditions and practices in the classroom as they existed as the context for establishing participant baselines. In this study, the teacher and paraprofessional continued with their normal instructional routines. During observational periods, the teacher taught either math or reading. The instructional strategy always began with the teacher at the front of the classroom presenting the lesson using a smart board. Students sat at their individual desks in three rows facing the front with at least two feet of space away from adjacent students and were expected to be taking notes.

Directly following group instruction, the teacher or paraprofessional handed each student a worksheet to complete before the end of the period, which lasted 30 minutes. As previously mentioned, the teacher had identified worksheet completion as the most likely time for misbehavior to occur. The researcher and RA collected data on the participant's behavior the instant the student received a worksheet and they continued data collection for five minutes. All reinforcement routines or plans designed by the teacher continued undisturbed by the presence of the researcher or RA, who were either in the back or side of the classroom observing unobtrusively. This included the use of a token economy where students received fictitious money for compliance with teacher requests and engagement in classroom activities. The

fictitious money can be used later for purchasing classroom store items, which the teacher supplied.

During this phase of the study, the researcher and RA collected observational data for each participant's targeted behaviors. No research interventions occurred before or during this period. When any of the identified targeted behaviors occurred during a five-minute observational period, an observer recorded the event on the data collection sheet. Baseline observations occurred daily throughout the week at the same time and progressed over a continuous five-minute period. Data collection continued until either a discernible pattern of behavior became evident, as defined by a minimum of three data points, or when it became evident a behavior pattern was not consistent. Even behavior patterns that are of high variability are useful. One may answer the question related to determining how many baseline points indicate a pattern by comparing it to the pattern of behavior in the treatment phase (Kennedy, 2005). The researcher compared a visual analysis of the level of data daily. He averaged the data to calculate the mean and median and estimate central tendency, which allowed for comparison of patterns between phases. Minimally, three data collection sessions occurred during baseline and, again, during the introduction of the treatment phase (O'Neill et al., 2011).

Intervention. When data collection indicated a participant achieved an acceptable baseline of a minimum of three data points and a central tendency was identified, the researcher introduced the intervention phase for that individual student. Directly before the task associated with disruptive behavior, the teacher or paraprofessional gave the iPod with the selected music to the participant. The teacher or paraprofessional often asked the participants if they required assistance in inserting the ear buds or operating the iPod to start the music. Once the student indicated that he or she understood how to use the iPod, the student then listened to the entire

recording of the music one time before the receiving the worksheet and pencil. The teacher or paraprofessional then retrieved the ear buds and iPod. At this moment, the researcher or RA began to collect data for a five-minute period of observation.

Experimental Design

The researcher used a multiple baseline across subjects in two settings to evaluate the effectiveness of the intervention. In multiple baseline experimental designs, the effects of the intervention are demonstrated by introducing the intervention to different participants at different times (Kazdin, 1982). Procedurally, when data for the first participant demonstrates a stable pattern; such as a minimum of three data points, the intervention was introduced to the next participant, with the process continuing until the intervention was implemented across all participants. For example, it took five sessions to determine a baseline for Susan, while it only took four sessions for Robert, and a discernable pattern could not be observed for Allen even after seven sessions. This design did not withdraw the intervention, as do A-B-A-B designs, because of an ethical concern; the researcher did not want to withdraw an intervention if there is a potential benefit to help alleviate undesirable or unproductive behaviors among participants (Kennedy, 2005). Operatively, if changes in the dependent variable (i.e., targeted behavior) occur, then a functional relation exists (March & Horner, 2002). Researchers have used the multiple-baseline-across-participants design for over 38 years to analyze educationally relevant behavior and has yielded a variety of important functional relations (Kennedy, 2005).

Data Analysis

During each phase, the researcher or RA collected and recorded data on the number of disruptive behavioral events recorded for each participant for the targeted behaviors and converted it to line graphs using Microsoft Excel software. Kennedy (2005) recommended that

line graphs be examined within-phase to visually analyze over three dimensions, looking for patterns within each dimension. The first dimension is used to examine the level of the dependent variable. Level refers to the average of the data calculated as the mean or median. This analysis allows for comparison of patterns between phases. The second dimension is the trend of the data. Here, both the researcher analyzes slope and magnitude, assigning it as high, medium, or low. The third dimension used to examine within-phase data patterns is variability. Variability is the degree to which the data points disperse relative to the best-fit straight line.

Kennedy (2005) also recommended visually inspecting data for patterns occurring between phases by examining immediacy of effect and overlap of data between phases. Immediacy of effect involves detecting how quickly a change in the data pattern emerges after the phase change. Overlap of data is identified when the percentage or degree to which data in adjacent phases share similar quantitative values.

Further analysis of participant performance on each of the dependent variable behaviors measured was made by calculating the mean and ranges. These are presented in figures 3-7. Comparison of data measurement for each participant during baseline and treatment sessions is presented in figures 1 and 2. Observational data for each individual was plotted using line graphs. Each data point represents an instance of targeted behavior occurring during a five-minute interval of time which rotated daily for each participant. The interval rotation cycle consisted of three five-minute segments where each participant was observed in either the first, second, or third five-minute period during a daily observational session. Each participant's data was graphed separately and visual inspection of each graph allowed the researcher to note any changes in level, trend, or from variability from baseline to intervention phases. In particular, the

researcher calculated the percent of overlapping data between phases to assess independence of conditions and calculate stability or change in trend of data.

Inter-observer Agreement, Treatment Integrity, and Social Validity

Inter-observer Agreement

Inter-observer agreement (IOA) is used to determine the quality of measurement procedures a researcher uses (O'Neill et al., 2011). This is important as it increases the confidence the researcher has in the operational definition of the target behavior and ensures the observed changes in the target behavior are due to the intervention rather than the perceptions of the individuals recording the data. During the course of the study, the researcher determined IOA by using the interval agreement method. This approach calculates interval agreement by comparing the recording of behaviors between two observers on an interval-by-interval basis. If both observers recorded the response as occurring or not occurring in a particular interval, it is scored as an agreement. If one failed to record the event as an occurrence, while the second observer did, then it is a disagreement. The total number of agreements is then divided by the total number of agreements plus disagreements and then multiplied by 100. The formula is A/A+D x 100%. Interval agreement is one of the most commonly used indexes of IOA. Twenty percent of the total observational sessions in both baseline and treatment phases were checked for IOA to assess the consistency of measurement. An acceptable level of agreement is 85% between raters (Kazan, 1982; Kennedy, 2005). Interobserver agreements for all three DVs combined was calculated for Allen, Rowan, Simon, Susan, and Craig during three days in both baseline and treatment sessions. The results are discussed in chapter 4.

Treatment Integrity

Validity of measures. The researcher and RA were committed to ensuring treatment integrity throughout all phases of the study. In baseline, observational data was collected to ensure that the intervention was not being introduced. The researcher, RA, classroom teacher, and paraprofessional observed all treatment sessions implemented. A checklist was used to record and verify procedures were implemented with fidelity according the experimental protocol of the study (see Appendix A for the Treatment Integrity Collection Sheet). The researcher calculated treatment integrity by dividing the number of times the intervention was implemented correctly by the number of sessions (trials) of implementation. He multiplied the sum by 100, which indicated percentages of treatment integrity across the study. Despite the observation that there is no consensus on what constitutes a criterion level for treatment integrity, the researcher deemed a criterion level of 80% a high level of treatment integrity throughout the trial.

Social Validity

Applied research done in a public setting such as in a public school occurs within a highly public context. Answers to other questions such as how did the students respond to the intervention? And, did the teacher think the intervention was appropriate and could be used in other settings? Answers to these questions help researchers gain insight as to the practicability of implementing an intervention in a larger social context. Social validity is defined as the effectiveness and importance and satisfaction different people experience responding to a specific intervention (Kazdin, 1977; Kennedy, 2005).

Prior to intervention and following the treatment phase, using the questions in Table 2, the researcher interviewed the teacher and paraprofessional to determine the social validity of the

listening to music as an intervention. He also asked students these interview questions two days after the study ended. The researcher conducted interviews individually and recorded responses recorded on paper (O'Neill et al., 2011).

Additionally, the researcher used the Intervention Rating Profile (IRP-15) to assess levels of satisfaction (Martens, Witt, Elliott, & Darveaux, 1985). The IRP-15 consists of 15 items and uses a Likert-scale rating system. The scores on the IRP-15 can range from 15-90, with higher scores indicating a greater acceptance level of the intervention. Reliability of the instrument has been documented as .98 (Martens et al., 1985). Scores above 52.50 are considered acceptable (Von Brock & Elliott, 1987). The paraprofessional and classroom teacher completed the IRP-15 at the conclusion of the study (see Appendices K and L for IRP-15).

Table 2. Pre and Post Social Validity Questions

Student Interview Questions (Post Intervention)	Teacher Interview Questions (Pre Intervention)
1. Did you like listening to music? 2. Did you feel more comfortable doing your work after listening to music? 3. Did listening to music help you to be able to focus on your work better? a. If it did, how do you think it helped? b. If it did not, why do you think it did not? 4. What did you like best about being able to listen to music before working? 5. What was the worst thing about listening to the music before working? 6. Would you like to be able to listen to music before beginning work in your other classes?	1. Do you like to listen to music? 2. Do you think listening to music will help students focus better? 3. Do you think listening to music will help improve academic engagement behaviors? 4. Do you think having the students listen to music will allow you as the teacher to be more efficient and effective? 5. What are your concerns about having the students listen to music before engaging in an assignment? 6. What benefits do you see in having the students listen to music before engaging in an assignment? 7. Do you think that having the students listen to music is something you would use in the future with your students Post intervention questions 1. Do you approve of the students listening to music before beginning their work? 2. Do you think having the student listen to music helps them be able to focus better? 3. Do you think the students were more confident in being able to do their work after listening to music? 4. Do you think it was better, worse, or equal to beginning independent work the usual way? 5. What do you like most and least about having the students listen to music before beginning an assignment? 6. Would you have your students listen to music again before starting an assignment? 7. Would you consider playing music to teach or reinforce behaviors or other academic skills?

CHAPTER FOUR: STUDY RESULTS

The purpose of this single-subject research study was to examine the effect listening to music had on talk out, out of seat, and off task behavior of students with EBD. The study was conducted using a single-case multiple baseline design across two settings with five participants. During baseline classroom conditions remained unchanged while the researcher and RA collected data. The treatment phase consisted of having participants use earbuds and an iPod to listen to a recording of classical music. The researcher conducted interobserver agreement across the study to determine reliability of the observation, treatment fidelity, and social validity assessments.

Results

Figures 1 and 2 present graphs of the data for each participant in math and reading, respectively. The researcher collected data for15 sessions over a four-week period: 4-9 days in Phase 1(baseline), 6-11 days in Phase II (treatment). Data were taken over a continuous five-minute period of instruction in math or reading early in the morning, once a day from Monday through Friday for each of the five participants.

Decrease in Talk-Outs

The first question addressed the extent that listening to music decreases talk-outs in children who demonstrated disruptive behaviors in a school setting. After obtaining and examining assessments and completing the procedural study, the researcher collected baseline and treatment data on the occurrences of talk-outs, for each participant. Based on each individual's response to the intervention, the number of data points varied across the participants within and among both phases. The sections below provide the results for each participant regarding the effect of antecedent listening to music on level of talk-outs.

Allen (baseline). The level of the data consisting of 9 data points is reflected by the mean of 1.5 for Allen for talk-out behavior during math instruction in phase 1 (see Figures 1 and 3). The level of the data is generally flat during this phase with a spike up on day two. The magnitude of the trend is low, as is the variability. Four out of six data points are at zero with little fluctuation within the phase between data points 1 and 3 and again between 4 and 6. Allen's behavior for talk-outs spiked on day 2 and remained high throughout baseline. When asked about this he was unable to provide an explanation.

Allen (treatment). During the treatment phase Allen's occurrence of talk-out behavior remained low, ranging from 0-2 incidences per observation. The mean of 0.6 is well below his baseline mean of 1.5. The slope is generally flat with a low magnitude of trend. There is low variability, showing little deviation from the overall trend.

Craig (baseline). The mean for Craig during phase I is 8.8 for talk-out behavior (see Figures 2 and 4). The slope of the data is erratic making it difficult to interpret the magnitude of a trend. The variability is high, with several data points deviating from a best-fit straight line. Craig was absent on day 5. When asked about the significant erratic changes in talk-out behavior from days 1 through 7 he stated that he was having a bad day.

Craig (treatment). During the treatment phase, Craig's talk-out behavior began from a point higher than his last point in baseline and then continued to occur, albeit at lower levels than in baseline (see Figure 2). The mean is 4.2, which is 48% lower than the baseline mean of 8.8. The magnitude of the trend is high, with high variability. Craig was absent on days 10, 11, and 12.

Simon (baseline). The baseline mean for Simon is 10.3 for talk-out behavior (see Figures 1 and 5). The slope of the data is positive and the magnitude of the trend is high ranging from a

high of 20 to a low of 4 data points. The variability is high and continues with an upward trend with the exception of one data point. Simon's inconsistent behavior in baseline may be attributable to his disability. When asked why his behavior was so intense on days 3 and 4 for talk-outs, he shared that he had a fight with another student on those days.

Simon (treatment). Even with high variability in the treatment phase, the incidence of talk-outs began from a point that was lower than the last data-point in the baseline phase (see Figures 1 and 5). With one data-point significantly away from the generally downward slope, the mean for Simon in this phase was 5.9, compared to 10.3 in baseline. This is a 42.7% decline over baseline behavior for talk-outs. His behavior spiked again on days 13 and 14 before a decline on day 15. When asked about his he provided no explanation for either the increase or decrease for this behavior.

Susan (baseline). Susan had a low rate for talk-out behavior in phase I (see Figures 2 and 6). The mean for this session was 0.8. The central tendency is flat with a low rate of variability. The classroom teacher indicated Susan takes medicine for her condition and has been diagnosed with borderline personality disorder, which is characterized by long-term patterns of unstable or turbulent emotions. Susan often times appeared groggy, which may explain her pattern of low incidence for talk-outs during this observational period.

Susan (treatment). During the treatment phase, Susan's occurrences of talking-out behavior remained at zero for two observations before slightly increasing (see Figure 2). The mean for phase II is 1.0, which is a fraction higher than her baseline mean of 0.8. Susan's response remained consistently low and she indicated she enjoyed listening to the music.

Rowan (baseline). Rowan's baseline mean for talk-out behaviors is 0.7 (see Figures 1 and 7). His trending pattern is almost flat with low magnitude. The variability of the pattern is also low. Rowan was absent on days two and three.

Rowan (treatment). Rowan's response to the intervention was not significant as he already had a low mean in baseline. With a mean of 0.3, he actually marginally decreased in talk-out behavior during phase II (see Figure 1). Rowan indicated he eagerly looked forward to listening to the music before beginning work on his daily math assignment.

Decrease in Off-Task Behaviors

The second research question addressed the extent listening to music decreases off-task behaviors in children with EBD in a school setting. Baseline and treatment data were collected in phases I and II on the number of occurrences of Off-Task for each participant and are presented below. Off-Task behaviors to be observed and recorded are defined as looking away from a worksheet for ten seconds or more.

Allen (baseline). Allen's baseline level for looking away from the worksheet has a mean of 9.3 (see Figure 3). His rate for looking away from work ranges from 2-18. The last three data points indicate a negative slope of medium magnitude. There is very little variability among the last three data points for looking away behavior. There is a spike in behavior on day three followed by a gradual reduction in subsequent days. When asked about this spike on day three he provided no explanation.

Allen (treatment). During this phase Allen's mean for looking away behavior is 3.2, which is a decrease of 65.6% from baseline (see Figure 3). When viewing the last three data points as the level of data for looking away behavior, there is a slight positive slope with low

variability. There is a spike in behavior on day eight and when asked about it, he was unable to provide an explanation.

Craig (baseline). Craig's mean for looking away behavior in phase I is 7.8, with data points ranging from1-17. His erratic behavior for the targeted behavior does not lend to labeling either slope or magnitude. With such high variability for looking away behavior, the last two data points indicate a negative slope with low variability (see Figure 4). Craig was absent on days five, ten, eleven, and twelve. When asked about his erratic behavior he was unable or unwilling to provide and explanation.

Craig (treatment). Craig's response to the treatment was significant. For looking away from worksheet behavior, the mean was 3.4 with data points ranging from 0–6. The difference between means from baseline to treatment is 56.4% lower.

Simon (baseline). The mean for Simon for looking away from worksheet behavior in baseline was 6.5, with data points ranging from 0-19. Simon's unpredictable behavior for looking away from the worksheet indicates high variability. There is no pattern for slope or magnitude (see Figure 5). Simon's inconsistent behavior in baseline may be attributable to his disability. When asked why his behavior was so intense on days three and four for looking away behavior he provided no explanation.

Simon (treatment). There is less variability in the treatment phase than in baseline. The mean for looking away from worksheet in treatment was 4.6, which is a decrease of 1.9 from baseline. This represents a 29% reduction over baseline for looking away from worksheet behavior. In treatment, the slope is negative with medium magnitude and moderate variability, with occurrences of behavior ranging from 1-15 incidents. Although Simon indicated a dislike

for listening to music in the post-intervention questionnaire, the occurrences of targeted behavior is markedly less in the treatment phase (see Figure 5).

Susan (baseline). Susan had a mean of 3.1 for looking away from worksheet behavior during baseline condition. The daily occurrences ranged from 0-18. (see Figure 6). There is low variability with the exception of day five, when she put her head down on her desk and refused to engage in any work. For looking away from worksheet behavior, the trend of data indicates a flat slope of low magnitude. Susan was absent on day two and ten. On day five her behavior for looking away spiked significantly from previous days then on subsequent days returned to former lows. When asked about this Susan indicated that she had not taken her medicine that day.

Susan (treatment). During the treatment phase, Susan's mean for looking away behavior was 1.4, with scores ranging from 0-4. The graph for looking away from worksheet behavior indicates a downward slope of low magnitude and low variability. There is a 65% decrease in the mean from baseline conditions for this behavior. (see Figure 6).

Rowan (baseline). The mean for looking away from the worksheet for Rowan was 0.2. His data points ranged from 0-1 for looking away from worksheet behavior. The graph indicates low variability with a flat slope with low magnitude for this behavior (see Figure 7).

Rowan (treatment). The mean for looking away from worksheet behavior is 0.3, with data points ranging from 0-1. There is a slight increase in looking away behavior because of two events that occurred on the first day of treatment. The variability was low, the slope flat, and low magnitude for this category of behavior measured (see Figure 7).

Rowan repeatedly announced that he enjoyed listening to music before engaging in working on a math worksheet.

Decrease in Out-of-Seat behaviors

The third research question addressed the question: to what extent does listening to music decrease out-of-seat behavior among children with EBD in a school setting. Baseline and treatment data were collected in phases I and II on the number of occurrences of out-of-seat behavior occurring for each participant are presented below. Based on each individual's response to the intervention, the number of data points varied across participants within and among both phases.

Allen (baseline). Allen's baseline level for out-of-seat behavior has a mean of 0.3 (see figures 1 and 3). With only two instances of this behavior occurring during baseline, trend of data and variability are small.

Allen (treatment). During the treatment phase Allen's mean decreased to zero with no instances of out-of-seat behavior occurring. This is a downward trend of data with small magnitude and little variability. With a zero instance of behavior there was an immediacy of effect (see figures 1 and 3).

Craig (baseline). The baseline level for out-of-seat behavior for Craig is 1.8 with a range between 0-8. With extreme variability, there is a downward slope with high magnitude (see figures 2 and 4).

Craig (treatment). The mean during the treatment phase is 1.4 which is 0.4 less than in baseline. With high variability with instances decreasing by two occurrences, there is a gradual increase in slope ending with zero occurrences. There is no immediacy of effect although there is a 0.4 decrease in mean difference between phases (see figures 2 and 4).

Simon (baseline/treatment). The baseline level for out-of-seat behavior for Simon is zero with no instances of behavior. With a single instance of behavior occurring in treatment phase there is an increase in mean difference of 0.1 (see figures 1 and 5).

Susan (baseline/treatment). The mean during both baseline and treatment phase is 0.8 for each phase. This represents no effect between phases(see figures 2 and 6).

Rowan (baseline/treatment). There were no instances of this behavior occurring during baseline and there were two instances on one day of this behavior during the treatment phase (see figures 1 and 7). This represents an increase in mean of 0.3 in treatment phase.

Effect Size

For this study, the researcher measured effect size using a percentage of non-overlapping data (PND) as an indicator of performance difference between baseline and intervention phases. The use of PND has long been recognized as the gold standard part of visual analysis in single-case design research (Parker, & Vannest, 2009; Scruggs, & Casto, 1987). Percentage of non-overlapping data ranges from 0 to 100%. A PND score greater than 90% is considered to have a strong effect, 70-80 is considered to indicate a fair effect, and a score of 50% or less is considered to indicate an the intervention is unreliable or ineffective. The PND scores for each participant for the three measured behaviors, (e.g. talk-outs, out-of-seat, and looking away from a worksheet for periods of 10 seconds or longer) are discussed below. There are four PND scores, all of which are less than 50%. Several participants have zero occurrences of the targeted behaviors in baseline, which render them unsuitable for use in calculating PND scores.

Allen. The PND for Allen for looking away from worksheet for 10 seconds or more was 22%, which indicates the intervention had no effect. Since Allen had at least one period in

baseline without displaying any instance of either talk out or out of seat behavior, no PND scores are obtainable (see Figure 3).

Craig. The PND for Craig for looking away from worksheet was 20% and the PND for talk out behavior was 40%. There was no score calculated for out of seat behavior as he had at least one zero occurrence in baseline. These scores indicate that the intervention yielded little effect for the two targeted behaviors yielding PDN scores (see Figure 4).

Simon. As there were zero instances of targeted behavior in baseline for both looking away from worksheet and out of seat behaviors, no PND scores were calculated. For talk out behavior, Simon scored a PND of 36%, which indicates little effect for the intervention (see Figure 5).

Susan. There are no PND scores for Susan as there are zero instances of targeted behaviors in each of the categories during baseline observations (see Figure 6).

Rowan. There are no PND scores available for Rowan as he had at least one occurrence of zero instances of targeted behaviors in baseline for talk out, out of seat, and looking away from worksheet (see Figure 7).

Inter-Observer Agreement

Using the interval agreement method with a minimum level of 85% agreement reached, the researcher collected data on 20% of baseline and intervention sessions. Data collected during math on all participants during two sessions in baseline was 91% and 100%. Data collected during the reading setting for all participants during two sessions in baseline was 100% for two sessions. Observational data collected and compared on two students during sessions 14 and 15 for the math setting resulted in an Inter-Observer Agreement (IOA) score of 93% and 94%

respectively. Observational data collected and compared for reading on days 14 and 15 was 88.2% and 93.3% respectively. The overall IOA mean for the study was 94.9%.

Treatment Integrity

Data was collected by following a checklist to record and verify that procedures implemented during the treatment phase were implemented with fidelity and consistency according to the experimental protocol of the study. The intervention was implemented correctly for each participant during each session of implementation. Treatment integrity was calculated to be 100% throughout the trial (see Appendix A).

Social Validity

The classroom teacher and paraprofessional completed the IRP-15 (see Appendices k and l). Total scores for the classroom teacher were 72 and 68 for the paraprofessional. Scores above 52.50 are considered acceptable so the scores indicated a high level of acceptability of the intervention. The teacher and paraprofessional completed both a pre- and post-intervention social validity questionnaire and generally indicate a positive approach to the conditions and results of the intervention (see Appendices G-J). Post-intervention student questionnaires generally indicate positive responses to questions regarding attitudes about the intervention (see Appendix M).

Summary of Findings

The research model rotated the time when each student was observed during both baseline and treatment for each of the two settings, math and reading. Each participant had the repeated opportunity of being observed in either the first or second setting. In the math setting, they were observed in the third five-minute period of a daily observation. A comparison of data indicates that the time when a student was observed as either being first, second, or sometimes

third, did not appear to establish a discernable pattern affecting any of the three targeted behaviors. Findings from this research study indicate that, during the treatment phase, there were fewer instances of looking away from a worksheet for periods of ten seconds or longer among four out of five participants in both math and reading settings. There also was a reduction in talk-outs among four out of five participants in both settings in the treatment phase. Finally, there were fewer instances of out-of-seat behavior for two students, a marginal increase for two students, and one with no effect. The PND for all students in either setting indicated that the intervention had little effect on the targeted behaviors.

Treatment integrity data substantiates that the intervention was implemented with a high level of fidelity across all participants and settings in the research study. Social validity data for teacher, paraprofessional, and students indicate the intervention was a highly acceptable intervention in addressing the targeted nonstandard behaviors of the students participating and is easily implemented in the natural environment (see Appendixes G-M).

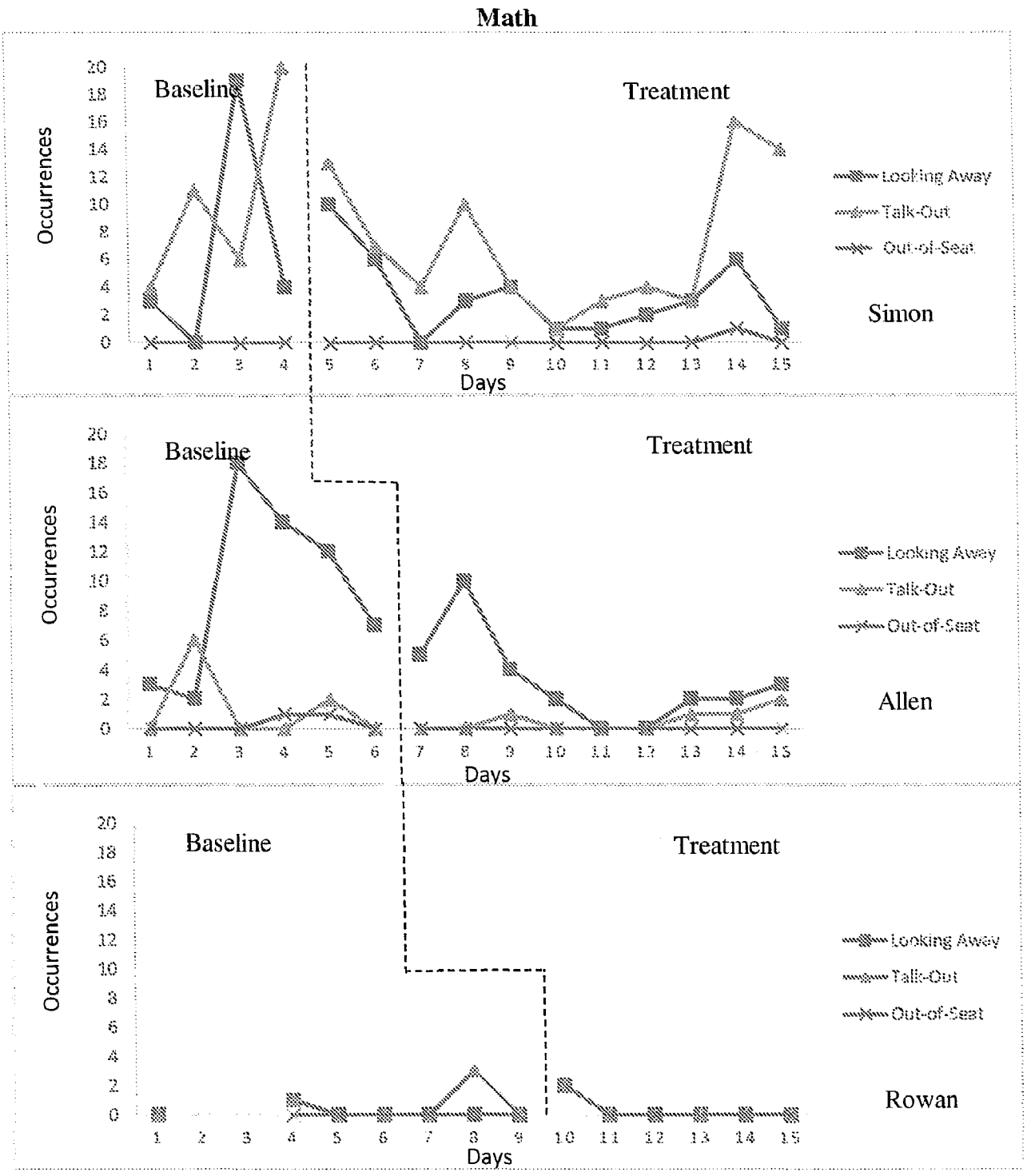


Figure 1. Graph of occurrences of targeted behaviors during baseline and treatment data for math.

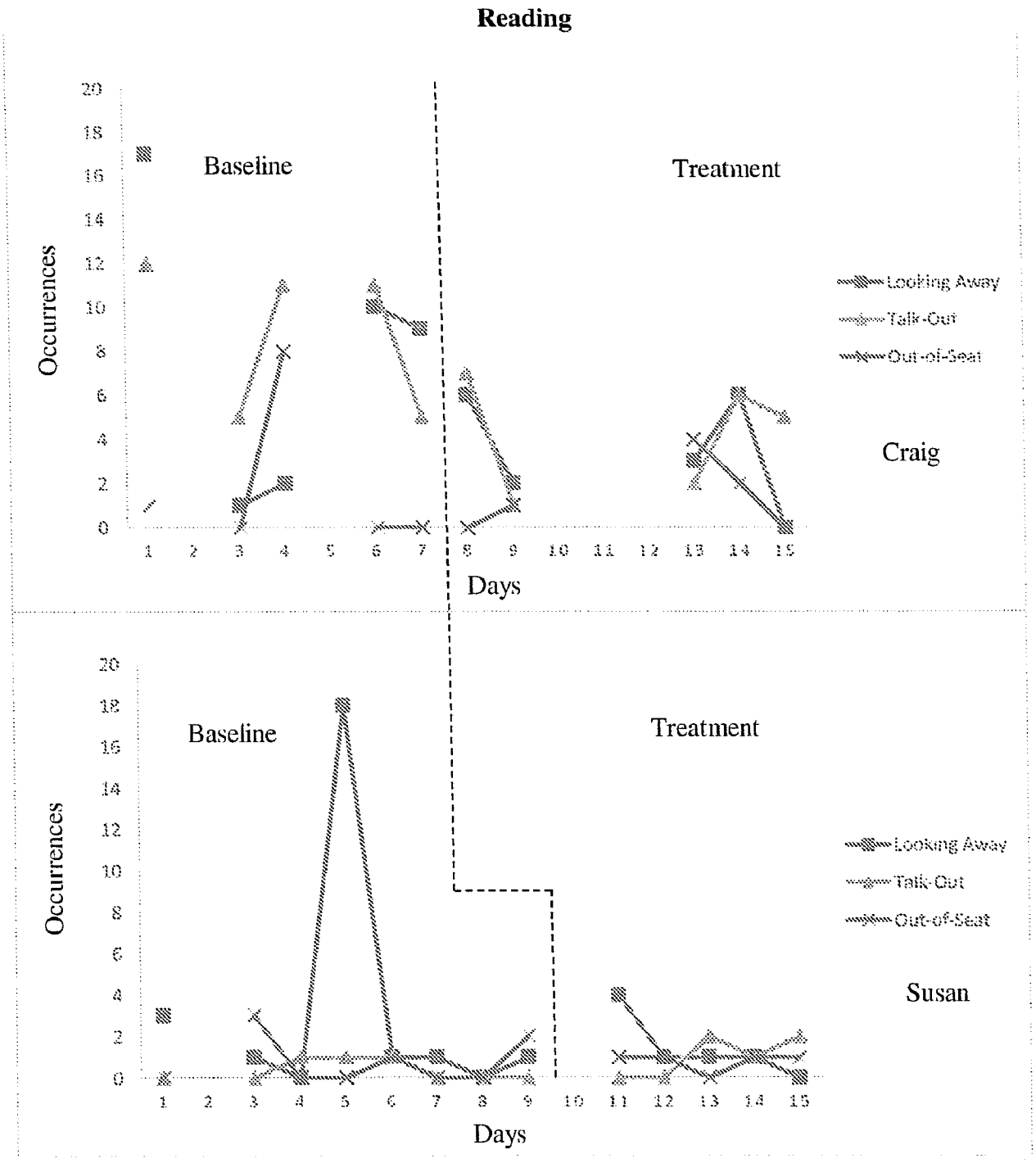


Figure 2. Graph of occurrences of targeted behaviors during baseline and treatment data for reading.

	Phase I				Phase II		
Day	Looking Away From Worksheet	Talk Out	Out Of Seat	Day	Looking Away from Worksheet	Talk Out	Out Of Seat
1	3	0	0	1			
2	2	6	0	2			
3	18	0	0	3			
4	14	0	1	4			
5	12	3	1	5			
6	7	0	0	6			
7				7	5	0	0
8				8	10	0	0
9				9	4	1	0
10				10	2	0	0
11				11	0	0	0
12				12	1	0	0
13				13	2	1	0
14				14	2	1	0
15				15	3	2	0
Total:	56	9	2	Total:	29	5	0
Mean:	9.3	1.5	.3	Mean:	3.2	0.6	0

Allen **Math**

Figure 3. Data for Allen.

Craig **Reading**

	Phase I				Phase II		
Day	Looking Away from Worksheet	Talk Out	Out Of Seat	Day	Looking Away from Worksheet	Talk Out	Out Of Seat
1	17	12	1	1			
2	Absent			2			
3	1	5	0	3			
4	2	11	8	4			
5	Absent			5			
6	10	11	0	6			
7	9	5	0	7			
8				8	6	7	0
9				9	2	1	1
10				10	ISS		
11				11	ISS		
12				12	ISS		
13				13	3	2	4
14				14	6	6	2
15				15	0	5	0
Total:	39	44	9	Total:	17	21	7
Mean:	7.8	8.8	1.8	Mean:	3.4	4.2	1.4

Figure 4. Data for Craig.

Simon **Math**

	Phase I				Phase II		
Day	Looking Away from Worksheet	Talk Out	Out Of Seat	Day	Looking Away from Worksheet	Talk Out	Out Of Seat
1	3	4	0	1			
2	0	11	0	2			
3	19	6	0	3			
4	4	20	0	4			
5				5	10	13	0
6				6	6	7	0
7				7	0	4	0
8				8	3	10	0
9				9	4	4	0
10				10	1	1	0
11				11	1	3	0
12				12	2	4	0
13				13	3	3	0
14				14	6	16	1
15				15	15	5	0
Total:	26	41	0	Total:	51	65	1
Mean:	6.5	10.3	0	Mean:	4.6	5.9	0.1

Figure 5. Data for Simon.

Susan **Reading**

	Phase I				Phase II		
Day	Looking Away from Worksheet	Talk Out	Out Of Seat	Day	Looking Away from Worksheet	Talk Out	Out Of Seat
1	3	0	0	1			
2	Absent			2			
3	1	0	3	3			
4	0	1	0	4			
5	18	1	0	5			
6	1	1	1	6			
7	1	0	0	7			
8	0	0	0	8			
9	1	0	2	9			
10				10	Absent		
11				11	4	0	1
12				12	1	0	1
13				13	1	2	0
14				14	1	1	1
15				15	0	2	1
Total:	25	3	6	Total:	7	5	4
Mean:	3.1	.8	.8	Mean:	1.4	1.0	0.8

Figure 6. Data for Susan.

Rowan **Math**

	Phase I				Phase II		
Day	Looking Away from Worksheet	Talk Out	Out Of Seat	Day	Looking Away from Worksheet	Talk Out	Out Of Seat
1	Absent			1			
2	Absent			2			
3	Absent			3			
4	1	1	0	4			
5	0	0	0	5			
6	0	0	0	6			
7	0	0	0	7			
8	0	3	0	8			
9	0	0	0	9			
10				10	2	2	2
11				11	0	0	0
12				12	0	0	0
13				13	0	0	0
14				14	0	0	0
15				15	0	0	0
Total:	1	4	0	Total:	2	2	2
Mean:	.2	.7	0	Mean:	0.3	0.3	0.3

Figure 7. Data for Rowan.

CHAPTER 5: SUMMARY AND DISCUSSION

The purpose of this study was to answer the question: Does listening to music have an effect on disruptive behaviors in children with EBD in school settings? The researcher used a multiple baseline across subjects in two settings design to collect data on the number of occurrences of disruptive targeted behaviors that interfered with participants' abilities to remain on-task using rotating 5 minute intervals. The intervention participants engaged in was listening to a pre-selected arrangement of classical music for approximately eight minutes as an antecedent to working independently at solving grade-level math problems or reading related assignments on a worksheet at their desk. The study progressed through the following phases:

1. Baseline data were collected through direct observation of each participant in the natural classroom environment to determine the frequency of targeted behaviors identified for participants.
2. Listening to music intervention was implemented for each participant and responses were recorded.

The following sections summarize the results of the study. The researcher then addresses implications for practice along with limitations of the study. The chapter concludes with a discussion on recommendations for future research.

Summary of Findings

The first research question was designed to determine the effects of listening to music as an antecedent intervention to decreasing talk-out behavior among students with disruptive externalized behaviors in a public school setting. Although the PND indicated the intervention had little effect, the mean differences among participants varies. However, the mean data for all

participants indicates a discernable decrease for talk-outs among four of the five participants (see figures 3-7).

The second research question focused on examining the impact of listening to music on decreasing off-task behaviors in students with disruptive behaviors. Off-task was operationally defined as visual attention not focused on a single academic task for a period of ten seconds or longer, while seated at a desk. Looking away from the paper assignment was considered to be not focused. While the PND indicates the intervention had little effect on the measured behavior, differences in mean among participants indicates a decrease in looking-away from worksheet behaviors for four participants and an increase in one (see figures 3-7).

The third research question focused exclusively on how many times a student was out of his or her seat during an observational period. Observation consisted of counting the occurrences of out-of-seat behavior. For out of seat behavior, there was a decrease for two participants, an increase for another two participants, and no change for one participant. PND scores indicate the intervention had little effect on reducing out of seat behavior (see figures 3-7).

Interpretation of Findings

Results of this study indicate that for students with EBD, engagement in listening to a predetermined selection of classical music immediately antecedent to a routine classroom activity had little effects in reducing off-task behaviors or in increasing on-task engagement. This assessment emerges from a comparison of mean differences supported by PND results indicating there is not a significant difference in targeted behavior attributable to the intervention for all participants.

The findings of this study are inconsistent with other studies measuring the effectiveness of using antecedent music on students with other disabilities regarding on-task behavior

problems (Dieringer & Porretta, 2013; Katagiri, 2009; Simpson & Keen, 2011). Although one may question whether antecedent listening to music in isolation can adequately and reliably mitigate disruptive EBD behavior in the classroom while increasing desirable levels of on-task behavior, its role as a part of a larger individual behavior management plan for students with challenging behavior is compelling. Despite that two participants indicated they preferred some other type of music all of the students participated in listening to the entire selection during each session during the treatment phase. Each was respectful in removing the earbuds and repacking the iPod in the original case and handing it to the teacher. The researcher finds this remarkable for middle-school aged students with EBD and he never expected such compliance levels. The intervention technique of having individual students with EBD listen to a prerecorded session of music before engaging in an non-preferred academic task focusing on the three targeted behaviors in this study is unique and there are no comparable studies to make comparisons (Goldbeck, & Ellerkamp, 2012; Hillier, Greher, Poto, & Dougherty, 2011; Hussey, & Layman, 2003; Robb, 2003; Sussman, 2009).

Implications for Practice

To this point, researchers had not studied the technique of having students listen to a prerecorded selection of music as an antecedent to mitigate disruptive behaviors in the classroom for this particular student population. The few studies to date on the effects of listening to music have been conducted primarily with students with autism show positive effects. In these studies behaviors were similar to behaviors of participants in this study (Dieringer, & Porretta, 2013; Katagiri, 2009; Simpson, & Keen, 2011). The results of this study indicate a continuing need for future research to discover interventions, which are efficacious for students with EBD in reducing disruptive behaviors and increasing time spent on-task. Although the results of this

study do not support any positive changes in measured behaviors linked to listening to music, previous studies do include listening to music as an important component to music therapy. When applying the results of this study to practice, it is important to note that the application of music therapy requires specialized academic and clinical training. Future research with larger sample sizes may allow for more definitive findings regarding the efficacy of listening to music as an antecedent intervention for students with EBD. As this study was based on a small sample size drawing any generalizable conclusion is unwarranted. In conclusion, this study failed to show the importance of listening to music and any potential benefit in mitigating disruptive behaviors in students with EBD.

Limitations of the Study

This research study contained a number of limitations that possibly affected the results. First, although taking prescriptive medications was not an exclusion criterion, it may have had an effect on an unknown number of participants in the study. For example, at least one of the students (Susan) was under medication during the entire time of the study. She displayed several dramatic responses during several sessions in both baseline and treatment phases that served to skew her data.

Second, the relatively small sample size limits generality across subjects (Kazdin, 1982; Kennedy, 2005). The school was located in a rural area and served a homogenous group of students. This sample represented a very small percentage of the school population (N=5).

A third limitation is associated with history effects, which occur outside of the classroom or experimental condition, which may have an influence or effect on the behavior being studied. These events include health problems, sleep deprivation, irritability from not eating, or

arguments with parents, students, others immediately preceding classroom instruction (Kennedy, 2005).

A fourth limitation may be attributable to response fatigue. The participants were asked to complete listening to the same selection of music for eight-minutes during each session during the treatment phase due to the need for repeated measures data in single-case design. Participants did not seem to mind the daily data collection sessions as they continued to be rewarded for compliance with the previously established classroom token economy. The limitation may come from participants having the potential of establishing a particular response set or similar response pattern. They may have learned the routine of listening to music and being rewarded so well that they seemed over time to respond automatically.

Fifth, there may have been a procedural limitation concerning the variability of the baseline data for many participants, which limited the ability to detect effects of the treatment studied. More baseline data points were needed to establish baseline stability for most of the participants. Because this is a study for a dissertation and due to a finite amount of time in order to complete all participants' assessments and collection of data, before the end of the semester, the treatment may have been introduced before stable baselines were established for some participants. In educational settings or with certain target behaviors, more variability may be permitted in the baseline phase (Horner, et al., 2005). The significant variability attributable to adolescence as well as with the primary disability are also factors that may have influenced the results of the study.

Sixth, participants were in a self-contained class and were functioning at different levels of ability for both math and reading. These variables may have contributed to feelings of

frustration by being either too challenging for some while boring for others which was not addressed in the study.

Seventh, during both baseline and treatment phases there was a classroom token economy in effect for all students. This may have served to be a bias as rewards were not administered routinely or equally for all participants.

Eight, the novelty of using an iPod and earbuds while in a classroom may have implications that were not considered. A condition of diminishing returns on the effectiveness of the use of novel devices may have been a bias, which was not considered.

Lastly, it would be difficult to generalize this study to other academic content and environments. Comparing the effectiveness of this intervention in less structured environments or in a general education setting would enhance the utility and reliability of this intervention.

Recommendations for Future Research

The practice of listening to music as an antecedent intervention in this study indicated that there was no significant difference. As this research study used a small purposive sample, drawing any generalizable conclusion is unwarranted. In planning future studies, researchers may wish to choose students of differing ages to determine if this intervention benefits students in various grades.

Future research may benefit from conducting more treatment sessions in order to determine whether a greater number of treatment sessions would have more dramatically improve behavior. A design consideration of continuing with the treatment phase as many times as is necessary for stable, noticeable and consistent change in behaviors occurring for each individual participant would better demonstrate the power of the intervention (Johnston & Pennypacker, 1993).

Future research should continue to examine interventions for students with EBD as they continue to have the highest dropout rates for students with exceptionalities (Heward, 2013). Students with EBD are also the most likely to continue receiving educational services in self-contained settings with fewer opportunities for socializing and being around non-disabled peers (Gargiulo, 2015).

Future research could select different behaviors to target in determining the effects of listening to music. The behaviors targeted for study in this report were selected based on teacher and record interviews. These behaviors may differ by region or cultural characteristics among participants in future studies.

Future researchers may wish to alter the subject content to something other than math or reading or use another characteristic such as transition periods or less structured times to measure the effects of the intervention. During the procedural study, the researcher selected reading as it was identified as a time most likely for disruptive behaviors to occur among the participants.

Researchers may wish to study the effects of listening to music broadcast through a portable speaker rather than iPods, loud enough for all classmates to hear. By using a speaker, researchers could eliminate any possible effects of manipulating earbuds and iPods.

Another suggestion is to use a different research design, such as A-B-A-B, where the treatment and withdrawal is simultaneously occurring among all participants. During this study, one participant who entered treatment first complained about being the only one listening to the music and would have preferred other students to enter treatment at the same time.

Last, researchers could use another genre or selection of music to measure the effects other categories of music may have on student behavior.

Summary

In conclusion, this study investigated the effects of listening to music on reducing disruptive classroom behaviors that interfere with learning while increasing the amount of time on-task for students with EBD. The researcher discussed findings from the study, criteria for determining efficacy of treatment, the study's limitations, and overall conclusions.

Quality indicators included as benchmarks in this study are as follows. The study provides a detailed and precise description of participants and settings, describing both the dependent and independent variables with operational and replicable precision. It describes baseline conditions with accuracy and consistency for all participants. It demonstrates experimental control and internal validity, with at least three sessions occurring in each phase and results demonstrating patterns of experimental control. External control was demonstrated through replication of intervention across participants and settings. Social validity was established through an indication that the dependent variable is important not only through an investigation of effect, but also is practical and cost effective (Horner et al, 2005; Odom et al., 2005). Finally, the researcher presented implications for educators and suggestions for future research.

REFERENCES

American Music Therapy Association (2014). Retrieved from http://www.musictherapy.org/about/quotes/.

American Music Therapy Association. (2013, June 16). What is music therapy? Retrieved from http://www.musictherapy.org/about/musictherapy/

Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. Journal of Applied Behavior Analysis,1, 91-97.

Baker, T. L., (1994). Doing Social Research (2nd ed.). New York: McGraw-Hill Inc.

Barlow, D. H., & Hayes, S. C. (1979). Alternating treatments design: One strategy for comparing the effects of two treatments in a single subject. Journal of Applied Behavior Analysis, 12, 199-210.

Barton-Atwood, S. M., Wehby, J. H., & Falk, K. B. (2005). Reading instruction for elementary age students with emotional and behavioral disorders: Academic and behavioral outcomes. Exceptional Children, 72, 7-27.

Benner, G. J., Mattison, R. E., Nelson, J. R., & Ralston, N. C. (2009). Types of language disorders in students classified as ED: Prevalence and association with learning disabilities and psychopathology. Education and Treatment of Children, 32(4), 631-653.

Benner, G. J., Nelson, J. R., Allor, J. H., Mooney, P., & Dai, T. (2008). Academic processing speed mediates the influence of both externalizing behavior and language skills on the academic skills of students with emotional disturbance. Journal of Behavioral Education, 17, 63-78.

Boreson, L. (2006). Effective programs for students with emotional behavioral disabilities (EBD). Ashland: Wisconsin Department of Public Instruction.

Bower, E. M. (1982). Defining emotional disturbance: Public policy and research. Psychology in the Schools,19, 55-60.

Bower, E. M., (1981). Early identification of emotionally handicapped children in school (3rd ed.). Springfield, IL: Charles C. Thomas.

Bowman-Perrott, L. J., Greenwood, C. R., & Tapia, Y. (2007). The efficacy of CWPT in secondary alternative school classrooms with small teacher/pupil rations and students with emotional and behavioral disorders. Education and Treatment of Children, 30, 65-87.

Brauner, C., & Stephens, C. (2006). Estimating the prevalence of early childhood serious emotional/behavioral disorders: Challenges and recommendations. Public Health Reports, 121(3), 303-310.

Campbell, S., & Skinner, C.H. (2004). Combining explicit timing with an interdependent group contingency program to decrease transition times: An investigation of the Timely Transitions Game. Journal of Applied School Psychology, 20, 11-27.

Carey, Y. A., & Halle, J. W. (2002). The effect of an idiosyncratic stimulus on self-injurious behavior during task demands. Education & Treatment of Children, 25, 131-141.

Carroll, J. M., Maughan, B., Goodman, R., & Meltzer, H. (2005). Literacy difficulties and psychiatric disorders: Evidence for comorbidity. Journal of Child Psychology and Psychiatry, 46(5), 524-532.

Chafin, S., Roy, M., Gerin, W., & Christenfeld, N. (2004). Music can facilitate blood pressure recovery from stress. British Journal of Health Psychology, 9, 393-403.

Chaput-McGovern, J., & Silverman, M. (2012). Effects of music therapy with patients on a post-surgical oncology unit: a pilot study determining maintenance of immediate gains. The Arts in Psychotherapy, 39, 417-422.

Coleman, M. C., & Webber, J. (2002). Emotional and behavioral disorders: theory and practice (4th ed.). Boston: Allyn and Bacon.

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

Congressional Research Service Report for Congress, (2013). The individuals with disabilities education act (IDEA), part B: Key statutory and regulatory provisions. Congressional Research Service, 7-5700. Washington, D.C.

Conroy, M., Stichter, J., Daunic, A., & Haydon, T. (2008). Classroom-based research in the field of emotional/behavioral disorders: Methodological issues and future research directions. Journal of Special Education, 42(4), 209-222.

Conroy, M. A., Sutherland, K., Haydon, T., Stormont, M., & Harmon, J. (2009). Preventing and ameliorating young children's chronic problem behaviors: An ecological classroom-based approach. Psychology in the Schools, 46(1), 3-17.

Conroy, M. A., Dunlap, G., Clarke, S., & Alter, P. J. (2005). A descriptive analysis of positive behavioral intervention research with young children with challenging behavior. Topics in Early Childhood Special Education, 25(3), 157-166.

Cook, B., G., & Odom, S., L. (2013). Evidence-based practices and implementation science in special education. Exceptional Children, 79(2), 135-144.

Cook, B. G., Tankersley, M., & Landrum, T. J. (2009). Determining evidence-based practices in special education. Exceptional Children, 75, 365-383.

Cullinan, D. (2007). Students with emotional and behavioral disorders: An introduction for teachers and other helping professionals (2nd ed.). Upper Saddle River, NJ: Pearson.

Cullinan, D., & Kauffman, J. M. (2005). Do race of student and race of teacher influence ratings of emotional and behavioral problem characteristics of students with emotional disorders? Behavioral Disorders, 30, 393-402.

Desrochers, M. N., Oshlag, R., & Kennelly, A. M. (2014). Using background music to reduce problem behavior during assessment with an adolescent who is blind with multiple disabilities. Journal of Visual Impairment & Blindness, 2, 61-66.

Dieringer, S. T., & Porretta, D. L. (2013). Using music to decrease off-task behaviors in young children with autism spectrum disorders. Palaestra, 27(1), 7-9.

Dodge, K. (1993). The future of research on conduct disorder. Development and Psychopathology, 5, 311-320.

Dunlap, G., Lovannone, R., Kincaid, D., Wilson, K., Christiansen, K., Strain, P. S., & English, C. (2010). Prevent, teach, reinforce: The school-based model of individualized positive behavior support. Baltimore: Brookes.

Dunlap, G., Strain, P., S., Fox, L., Carta, J., J., Conroy, M., Smith, B., J., Kern, L., Hemmeter, M., L., Timm, M., A., McCart, A., Sailor, W., Markey, U., Markey, D., J., Lardieri, S., & Sowell, C. (2006). Prevention and intervention with young children's challenging behavior: A review of reviews. Behavioral Disorders, 32, 29-45.

Elliott, D., Polman, R., & McGregor, R. (2011). Relaxing music for anxiety control. Journal of Music Therapy, 48(3), 264-288.

Farley, C., Torres, C., Wailehua, C., & Cook, L. (2012). Evidence-based practices for students with emotional and behavioral disorders: Improving academic achievement. Beyond Behavior, 20(2), 37-43

Forness, S. R., & Kavale, K. A. (2001). ADHD and a return to the medical model of special education. Education and Treatment of Children, 24, 224-247.

Freeman, J., & Sugai, G. (2013). Identifying evidence-based special education interventions from single-subject research. Council for Exceptional Children, 45(5), 6-12.

Frey, A., & George-Nichols, N. (2003). Intervention practices for students with emotional and behavioral disorders: Using research to inform school social work practice. Children and Schools, 25(2), 97-104.

Forness, S. R., & Kavale, K. A. (2000). Emotional behavioral disorders: Background and current status of the E/BD terminology and definition. Behavioral Disorders, 25, 264-269.

Forness, S. R., & Knitzer, J. (1992). A new proposed definition and terminology to replace "serious emotional disturbance" in the individuals with disabilities education act. School Psychology Review, 21, 12-20.

Furlong, M. J., Morrison, G. M., & Jimerson, S. (2004). Externalizing behaviors of aggression and violence in the school context. In R. B. Rutherford, M. M. Quinn, & S. R. Mathur (Eds.), Handbook of research in emotional and behavioral disorders (pp. 243-261). New York: Guilford.

Gargiulo, R. M. (2015). Special education in contemporary society (5th ed., media Ed.). Thousand Oaks: Sage Publications.

Gargiulo, R. M. (2012). Special education in contemporary society: an introduction to exceptionality (4th ed., media Ed.). Thousand Oaks: Sage Publications.

Gast, D. L. (2010). Single subject research methodology in behavioral sciences. New York: Routledge.

Gersten, R., Fuchs, L. S., Compton, D., & Coyne, M. (2005). Quality indicators for group experimental and quasi-experimental research in special education. Exceptional Children, 71, 149-164.

Giangreco, M. F., (2011). Educating students with severe disabilities: Foundational concepts and practices. In M. E. Snell & F. Brown (Eds.), Instruction of students with severe disabilities (7th ed., pp. 1-30). Upper Saddle River, NJ: Pearson.

Goldbeck, L., & Ellerkamp, T. (2012). A randomized controlled trial of multimodal music therapy for children with anxiety disorders. Journal of Music Therapy, 49(4), 395-413.

Gresham, F., M. (2005). Response to intervention: An alternative means of identifying students as emotionally disturbed. Education and Treatment of Children, 28(4), 328-344.

Guetin, S., Soua, B., Voiriot, G., Picot, M., & Herisson, C. (2009). The effect of music therapy on mood and anxiety-depression: An observational study in institutionalized patients with traumatic brain injury. Annals of Physical and Rehabilitation Medicine, 52, 30-40.

Hallam, S., & Price, J. (1998). Can the use of background music improve the behavior and academic performance of children with emotional and behavioral difficulties? British Journal of Special Education, 25, 88-91.

Hallam, S., Price, J., & Katsarou, G. (2002). The effects of background music on primary school pupils' task performance. Educational Studies, 28, 111-122.

Heward, W. L. (2003). Ten faulty notions about teaching and learning that hinder the effectiveness of special education. Journal of Special Education, 36(4), 186-205.

Heward, W. L. (2013). Exceptional children: an introduction to special education (10th ed.). Upper Saddle River: Pearson.

Hillier, A., Greher, G., Poto, N., & Dougherty, M. (2011). Positive outcomes following participation in a music intervention for adolescents and young adults on the autism spectrum. Psychology of Music, 40(2), 201-215.

Hitchen, H., Magee, W., & Soeterik, S. (2010). Music therapy in the treatment of patients with neuro-behavioural disorders stemming from acquired brain injury. Nordic Journal of Music Therapy, 19(1), 63-78.

Hong, M., Hussey, D., & Heng M. (1998). Music therapy with severely emotionally disturbed children in a residential treatment setting. Music Therapy Perspectives 16(2), 170-180.

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

Horner, R. H., Sugai, G., Anderson, C. M., (2010). Examining the evidence base for school-wide positive behavior support. Focus on Exceptional Children, 42(8), 1-14.

Hussey, D. L., & Layman, D. (2003). Music therapy with emotionally disturbed children. Psychiatric Times, 20(6), 37-39.

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

Jeon, E., Kim, S., & Yoo, H. (2009). Effects of music therapy and rhythmic exercise on quality of life, blood pressure and upper extremity muscle strength in institution-dwelling elderly women. Journal of Korean Academy of Nursing, 39, 829-839.

Johnson, J. M., & Pennypacker, H. S. (1993). Strategies and tactics of behavioral research. Hillsdale, NJ: Lawrence Erlbaum Associates.

Katagiri, J. (2009). The effect of background music and song texts on the emotional understanding of children with autism. Journal of Music Therapy, 46, 15-31.

Kauffman, J. M., & Landrum, T. J. (2009). Characteristics of emotional and behavioral disorders of children and youth (9th ed.). Upper Saddle River, NJ: Prentice Hall

Kazdin, A. E. (1982). Single-case research designs: Methods for clinical and applied settings. New York: Oxford University Press.

Kazdin, A. E. (1977). Assessing the clinical or applied significance of behavior change through social validation. Behavior Modification, 1, 427-452.

Keller, E.F. (2002). Making sense of life: Explaining biological development with models, metaphors, and machines. Cambridge, MA: Harvard University Press

Kennedy, C. H. (2005). Single-case designs for educational research. Boston: Pearson/A & B.

Kim, J., Wigram, T., & Gold, C. (2009). Emotional, motivational and interpersonal responsiveness of children with autism in improvisational music therapy. Autism, 13(4), 389-409.

King, N. J., Heyne, D., & Ollendick, T. H. (2005). Cognitive-behavioral interventions for anxiety and phobic disorders in children: A review. Behavioral Disorders, 30, 241-257.

Krikeli, V., Michailidis, A., & Klavdianou, N. (2010). Communication improvement through music: The case of children with developmental disabilities. International Journal of Special Education, 25(1), 1-9.

Landrum, T., Katsiyannis, A., & Archwamety, T. (2004). An analysis of placement and exit patterns of students with emotional and behavioral disorders. Behavioral Disorders, 29, 140-153.

Landrum, T., Tankersley, M., & Kauffman, J.M. (2003). What is special about special education for students with emotional or behavioral disorders? Journal of Special Education, 37, 148-156.

Lane, K. L., Little, M. A., Redding-Rhodes, J., Phillips, A., & Welsh, M. T. (2007). Outcomes of a teacher-led reading intervention for elementary students at risk for behavioural disorders. Exceptional Children, 74, 47-70.

Layman, D., Hussey, D., & Laing, S. (2002). Foster care trends in the United States: Ramifications for music therapists. Music Therapy Perspectives, 20(1), 38-46.

LeFever, G. B., Villers, M. S., & Morrow, A. L. (2002). Parental perceptions adverse educational outcomes among children diagnosed and treated for ADHD: Call for improved school/provider collaboration. Psychology in the Schools, 39, 63-70.

Lewis, T. J., Hudson, S., Richter, M., & Hodson, N. (2004). Scientifically supported practices in emotional and behavioral disorders: A proposed approach and brief review of current practices. Behavioral Disorders, 29, 247-259.

Li, X., Yan, H., Zhou, K., Dang, S., Wang, D., & Zhang, P. (2011). Effects of music therapy on pain among female breast cancer patients after radical mastectomy: results from a randomized controlled trial. Breast Cancer Research Treatment, 128(2), 411-419.

Lin, L., Lee, W., Yang, R., Wang, C., Chen, H., Wu, H., et al. (2011). Mozart K.448 acts as a potential add-on therapy in children with refractory epilepsy. Epilepsy & Behavior, 20, 490-493.

Lin, M., Hsieh, Y., Hsu, Y., Fetzer, S., & Hsu, M. (2011). A randomized controlled trial of the effect of music therapy and verbal relaxation on chemotherapy-induced anxiety. Journal of Clinical Nursing, 20, 988-999.

Lipsey, M., W., & Derzon, J., H. (1998). Predictors of violent or serious delinquency in adolescence and early adulthood: A synthesis of longitudinal research. In R. Loeber & D. P. Farrington (Eds.), Serious and violent juvenile offenders: Risk factors and successful interventions (pp. 6-105). Thousand Oaks, CA: Sage.

Loeber, R., Burke, J. D., Lahey, B. B., Winters, A., & Zera, M. (2000). Oppositional defiant and conduct disorder: A review of the past 10 years, part 1. Journal of the American Academy of Child & Adolescent Psychiatry, 39, 1468-1484.

Maag, J. W., & Swearer, S. M. (2005). Cognitive-behavioral interventions for depression: Review and implications for school personnel. Behavioral Disorders, 30,259-276.

March, R. E., & Horner, R. H. (2002). Feasibility and contributions of functional behavioral assessment in schools. Journal of Emotional and Behavioral Disorders, 10, 158-170.

Martens, B. K., Witt, J. C., Elliott, S.N., & Darveaux, D. X. (1985). Teacher-judgments concerning the acceptability of school-based interventions. Professional Psychology: Research and Practice. 16, 191-198. Doi:10.1037/0735-7028.16.2.191

McEvoy, A., & Welker, R. (2000). Antisocial behavior, academic failure, and school climate: A critical review. Journal of Emotional and Behavioral Disorders, 8, 130-140.

Meadows, N. B., Neel, R. S., Scott, C. M., & Parker, G. (1994). Academic performance, social competence, and mainstream accommodations: A look at mainstreamed and non-mainstreamed students with serious behavioral disorders. Behavioral Disorders, 19, 170-180.

Mehrotra, S., Ahamad-Manzur, Y., Ooi, C., Lim, D., Fung, D., & Ang, R. (2011). Prevalence of Behavioral and emotional problems in children at-risk for learning difficulties. European Psychiatry, 26(1), 326-333.

Melfsen, S., Osterlow, J., & Florin, I. (2000). Deliberate emotional expressions of socially anxious children and their mothers. Journal of Anxiety Disorders, 14, 249-261.

Merrell, K. W., & Walker, H. M. (2004). Deconstructing a definition: Social maladjustment versus emotional disturbance and moving the EBD field forward. Psychology in the Schools, 41(8), 899-910.

Miller, E. B. (2011). Bio-guided music therapy: a practitioner's guide to the clinical integration of music and biofeedback. London: Jessica Kingsley Publishers.

Miranda, A., Soriano, M., Fernandez, I., & Melia, A. (2008). Emotional and behavioral problems in children with attention deficit-hyperactivity disorder: Impact of age and learning disabilities. Learning Disability Quarterly, 31, 171-185.

Montello, L. (1999). A psychoanalytic music therapy approach to treating adults traumatized as children. Music Therapy Perspectives 17(2), 74-81.

Montello, L., & Coons, E. E. (1998). Effects of active versus passive group music therapy on preadolescents with emotional, learning, and behavioral disorders. Journal of Music Therapy, 35(1), 49-67.

Mooney, P., Ryan, J. B., Uhing, B. M., Reid, R., & Epstein, M. H. (2005). A review of self-management interventions targeting academic outcomes for students with emotional and behavioral disorders. Journal of Behavioral Education, 14, 203-221.

Nelson, J. R., Benner, G. J., & Cheney, D. (2005). An investigation of the language skills of students with emotional disturbance served in public school settings. Journal of Special Education, 39, 97-105.

Nilsson, S., Kokinsky, E., Nilsson, U., Sidenvall, B., & Enskar, K. (2009). School-aged children's experiences of postoperative music medicine on pain, distress, and anxiety. Pediatric Anesthesia, 19, 1184-1190.

No Child Left Behind Act of 2001, 107 U.S.C.

Odom, S., Brantlinger, E., Gersten, R., Horner, R., Thompson, B., & Harris, K. (2005). Research in special education: Scientific methods and evidence-based practices. Exceptional Children, 71, 137-148.

Oliver, R. M., & Reschly, D. J. (2007). Effective classroom management: teacher preparation and professional development. National Comprehensive Center for Teacher Quality. http://files.eric.ed.gov/fulltext/ED543769.pdf (Accessed March 15, 2014).

O'Neill, R. E. (1997). Functional assessment and program development for problem behavior: A practical handbook (2nd ed.). Pacific Grove, CA: Brooks/Cole Pub.

O'Neill, R. E., McDonnell, J., Billingsley, F., & Jenson, W. (2011). Single case research designs in educational and community settings. Boston: Pearson.

Park, J. H., Alber-Morgan, S. R., & Cannella-Malone, H. I. (2011). Effects of mother-implemented picture exchange communication system training on spontaneous communicative behaviors of young children with autism spectrum disorders. Topics in Early Childhood Special Education, 31(1), 37-47.

Parker, R. I., & Vannest, K., (2009). An improved effect size for single-case research: Nonoverlap of all pairs. Behavior Therapy, 40, 357-367.

Pavlov, I. (1928). Lectures on conditioned reflexes. (W. H. Gantt, trans.) New York: International.

Payne, L., Marks, L. J., & Bogan, B. L. (2007). Using curriculum-based assessment to address the academic and behavioral deficits of students with emotional and behavioral disorders. Beyond Behavior, 16, 3-6.

Pennington, B. F. (2002). The development of psychopathology: Nature and nurture. New York: Guilford.

Perry, B. (2006). Applying principles of neurodevelopment to clinical work with maltreated and traumatized children. In N. Webb (Ed.), Working with traumatized youth in child welfare (pp. 27-52). New York: The Guilford Press.

Polit, D. F., Beck, C. T., & Hungler, B. P. (2001). Essential of nursing research: Methods, appraisal, and utilization (5th ed). Philadelphia: Lippincott.

Polloway, E. A., Patton, J. R., Serna, L., & Bailey, J. (2013). Strategies for teaching learners with special needs (10th ed.). Boston: Pearson.

Public Law 108-446, 20 CFR 300.8[c] [4]

Qi, C. H.., & Kaiser, A. P. (2003). Behavior problems of preschool children from low-income families: Review of the literature. Teaching Early Childhood Special Education, 23, 188-216.

Regan, K., S., & Michaud, K., M. (2011). Best practices to support student behavior. Beyond Behavior, 20(2), 47.

Reid, R., Trout, A., & Schwartz, M. (2005). Self-regulation interventions for children with attention deficit/hyperactivity disorder. Exceptional Children, 71, 361-377.

Reynolds, C. R., & Kamphaus, R. W. (2004). Behavior Assessment System for Children (2nd ed.). Circle Pines, MN: American Guidance Service.

Rhee, S. H., & Waldman, I. D. (2002). Genetic and environmental influences on antisocial behavior: A meta-analysis of twin and adoption studies. Psychological Bulletin, 128, 490-529.

Rhode, G., Jenson, W. R., & Reavis, H. K. (1998). The tough kid book: Practical classroom management strategies. Longmont, CO: Sopris West.

Rietz, C., Hasselhorn, M., & Labuhn, S. (2012). Are externalizing and internalizing difficulties of young children with spelling impairment related to their ADHD symptoms? Dyslexia, 18, 174-185.

Robb, S. (2003). Music interventions and group participation skills of preschoolers with visual impairments: raising questions about music, arousal, and attention. Journal of Music Therapy, 40, 266-282.

Roberts, R. E., Attkisson, C. C., & Rosenblatt, A. (1998). Prevalence of psychopathology among children and adolescents. American Journal of Psychiatry, 155, 715-725.

Robinson, P. W., Newby, T. J., & Ganzell, S. L. (1981). A token system for a class of underachieving hyperactive children. Journal of Applied Behavior Analysis, 14, 307-315.

Rose, C., A., & Espelage, D., L. (2012). Risk and protective factors associated with the bullying involvement of students with emotional and behavioral disorders. Behavioral Disorders, 37, 133-148.

Rossiter, R., Slaney, K., & Tulloch, L. (2011). Emotion management for young people with severe learning disabilities. Learning Disability Practice, 14(6), 21-24.

Ruff, H., & Rothbart, M. (1996). Attention in Early Development. New York: Oxford University Press.

Ryan, S., & Chionnaith, M. (2006). On the spectrum: Similarities and differences between students with fetal alcohol spectrum disorders and autism spectrum disorders in Ireland. Journal of International Special Needs Education, 9, 43-52.

Schoenfeld, N., & Janney, D. (2008). Identification and treatment of anxiety in students with emotional or behavioral disorders: A review of the literature. Education and Treatment of Children, 31(4), 583-610.

Scott, T. M., Bucalos, A., Liaupsin, C., Nelson, C. M., Jolivette, K., & DeShea, L. (2004). Using functional behavior assessment in general education settings: Making a case for effectiveness and efficiency. Behavioral Disorders, 29, 189-201.

Scruggs, M., & Casto, B. (1987). The quantitative synthesis of single-subject research. Remedial and Special Education (RASE), 8, 24-33.

Sealander, K. (2003). Single subject experimental research: An overview for practitioners. In K. deMarrias and S. Lapan (Eds.) Inquiry frameworks in the social sciences: ways of knowing. Mahwah, NJ: Lawrence Erlbaum Associates.

Siedliecki, S., & Good, M. (2006). Effects of music on power, pain, depression and disability. Journal of Advanced Nursing, 54(5), 553-562.

Simonsen, B., Fairbanks, S., Briesch, A., Myers, A., & Sugai, G. (2008). Evidence-based practices in classroom management: Considerations for research to practice. Education and Treatment of Children, 31, 351-380.

Simpson, K., & Keen, D. (2011). Music interventions for children with autism: Narrative review of the literature. Journal of Autism and Developmental Disorders, 41, 1507-1514.

Skinner, B. (1966b). Operant behavior. In W.K. Honig (Ed.), Operant behavior: Areas of research and application (pp. 12-32). New York: Appleton-Century-Crofts.

Slavin, R.E. (1992). Research methods in education. (2nd ed.) Boston, MA: Allyn and Bacon.

Spielberger, C. D., & Sydeman, S. J. (1994). State-Trait anxiety inventory and state-trait anger expression inventory. In M. E. Maruish (Ed.), The Use of Psychological Testing for Treatment Planning and Outcome Assessment. Hillsdale, NJ: Lawrence Erlbaum Associates.

Sprague, J., & Walker, H. (2000). Early identification and intervention for youth with antisocial and violent behavior. Exceptional Children, 66, 367-379.

Spirito, A., & Overholser, J. C. (Eds.). (2003). Evaluating and treating adolescent suicide attempters: From research to practice. New York: Academic Press.

Stainback, S., & Stainback, W. (Eds.). (1996). Inclusion: A guide for educators (2nd ed.). Baltimore: Brooks.

Standley, J. (2012). A discussion of evidence-based music therapy to facilitate feeding skills of premature infants: The power of contingent music. The Arts in Psychotherapy, 39, 379-382.

Standley, J. (2000). The effect of contingent music to increase non-nutritive sucking of premature infants. Pediatric Nursing, 26(5), 493-495.

Steele, K. M., Bass, K. E., & Crook, M. D. (1999). The mystery of the Mozart effect: Failure to replicate. Psychological Science, 10(4), 366-369.

Stroul, B. A., Friedman, R. M. (1994). A system of care for children and youth with severe emotional disturbances. CASSP Technical Assistance Center, Georgetown University Child Development Center, Washington, D.C.

Sugai, G., Horner, R. H., Algozzine, R., Barrett, S., Lewis, T., Anderson, C., Bradley, R., Choi, J. H., Dunlap, G., Eber, L., George, H., Kincaid, D., McCart, A., Nelson, M., Newcomer,

L., Putnam, R., Riffel, L., Rovins, M., Sailor, W., & Simonsen, B. (2010). School-wide *positive behavior support: Implementers' blueprint and self*-assessment. Eugene: University of Oregon.

Sussman, J. (2009). The effect of music on peer awareness in preschool age children with developmental disabilities. Nordic Journal of Music Therapy, 46(1), 53-68.

Taylor, S. J. (2005). Caught in the continuum: A critical analysis of the principle of the least restrictive environment. Research and Practice for Persons with Severe Disabilities, 30, 218-230.

Thompson, W. F., Schellenberg, E. G., & Husain, G. (2001). Arousal, mood, and the Mozart effect. Psychological Science, 12(3), 248-251.

U.S. Department of Education. (2012). 31st Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act, 2009 (Table 20). Washington, DC: retrieved October 11, 2014, from http://www2.ed.gov/about/reports/annual/osep/index.html

U. S. Department of Education. (2011). Individuals with Disabilities Education Act (IDEA) data (Tables 1-3). Washington, DC: Retrieved February 3, 2014, from https://www.edeadata.org/arc_toc11.asp#partbCC

Vianna, M., Barbosam, A., Carvalhaes, A., & Cunha, A. (2011). Music therapy may increase breastfeeding rates among mothers of premature newborns: a randomized controlled trial. Journal de Pediatria, 1(87), 206-212.

Von Brock, M. B., & Elliott, S. N. (1987). Influence and treatment of effective information on the acceptability of classroom interventions. Journal of School Psychology, 25, 131-144.

Wagner, M., Kutash, K., Duchnowski, A. J., Epstein, M. H., & Sumi, 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, 11, 194-197.

Walker, H. M., Ramsey, E., & Gresham, R. M. (2005). Antisocial behavior in school: Evidence-based practices (2nd ed.). Belmont, CA: Wadsworth/Thomson Learning.

Walker, H. M. (1997). The acting out child: Coping with classroom disruption (2nd ed.). Longmont, CO: Sopris West.

Watson, G. S., & Gross, A. M. (2000). Familial determinants. In M. Hersen & R. T. Ammerman (Eds.), Advanced abnormal psychology (2nd ed., pp. 81-99). Hillsdale, NJ: Erlbaum.

Webber, J., & Plotts, C. A. (2008). Emotional and behavioral disorders: Theory and practice (5th ed.). Boston: Allyn & Bacon.

31st Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act, 2009 (2012).

APPENDIX A TREATMENT INTEGRITY

Treatment Integrity

Record "+" if the specific procedure is followed, "-"if the procedure is not followed. Record "NA" if the procedure is not needed.

Student: _____ Date: _____ Setting: _____

Trial	iPod, Earbuds, Ready: Charged, Music Cued at Beginning	Intervention Presented Before Task Assignment	iPod, Earbuds, Retrieved Immediately after 8 Minutes
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

APPENDIX B. PARENTAL CONSENT FORM

NORTHERN ARIZONA UNIVERSITY

Human Subject

Parental Consent

College of Education, Curriculum and Instruction,

801 S. Knoles Drive, Flagstaff, AZ 86011 (864) 356-1592

Project Title: Does listening to music have an effect on disruptive behavior among students with emotional/behavioral disorders

Dear Parent/Guardian:

Your child is being asked to participate in a project conducted through the College of Education, Curriculum and Instruction department, at Northern Arizona University by Anthony P. Rothfork that involves research. The researcher is required to receive your consent before your child participates in this project.

This document will explain to you in detail: (1) the purpose of the project; (2) what your child will be asked to do and how long participation will last; (3) how personal information, if collected, will be kept confidential; (4) if your child will receive any compensation; (5) the possible benefits; and (6) potential risks for your child if he or she agrees to participate.

Your child's participation in research is voluntary. If you choose not to give consent for your child to participate, there are no penalties or loss of benefits or services that you or your child are otherwise entitled. If you decide to give consent and then change your mind or withdraw your child prior to completion of the research, there are no penalties or loss of benefits or services. Regardless of whether you give consent or your child agrees or disagrees to take part in this research, there will is no effect on your relationship with NAU now or in the future.

A basic explanation of the project is written below. Please read this explanation and discuss it with your child. If you need more information, you may contact Anthony P. Rothfork at the phone number and email address below.

If you decide to allow your child to participate in the research, please sign on the last page of this form and return the last page to Anthony P. Rothfork by handing it to him. Keep the rest of this form for your records. Once the researcher has your signed parental consent, your child will be invited to take part in the research. Anthony P. Rothfork will explain the study to your child and answer any questions he or she may have. If your child agrees to participate, he or she may be asked to sign a Child Assent Form before taking part in the research study.

1. PROJECT PURPOSE:

The purpose of this project is to investigate the effects that listening to music may have on children with an emotional/behavioral disability.

2. EXPLANATION OF PROCEDURES:

This investigation will take place in the classroom at the school your son/daughter normally attends. I or another research assistant will be observing and taking notes on your child's behavior as he/she participates in reading instruction as usually taught by your child's teacher in the classroom for a period of no more than 30 minutes possibly every day. After a few weeks I will then softly play out loud on a CD player with speakers a recording of a selection of music from Mozart for nine minutes while students are seated at their desks preparing to complete a worksheet for reading from a lesson taught by the teacher that day. I or another research assistant will be observing to see if listening to music had an effect on your child's engagement in work or their behavior. Observations may occur during regular class periods of instruction over a two month period.

3. CONFIDENTIALITY:

Your child's confidentiality is of upmost importance. At no time before, during, or after will the school district, school, teachers, parents, students, or anyone else be referred to by name, location, or in any other manner so as to be identifiable. All records, forms, observational data collected with the study will be maintained securely by the principal researcher, Anthony P. Rothfork.

4. COMPENSATION:

There is no compensation for participation in this study.

5. BENEFITS:

Music has been used by music therapists and others as a method to influence mood and behavior among a variety of listeners of all ages. It is believed that students listening to this brief

recording of classical music may benefit by being more willing to begin working on an individual assignment and remain working longer without getting off-task. The results of this study may advance our knowledge of the effects of listening to music on children in school and may be made public.

6. RISKS:

There are no known risks associated with this study. The intervention will be of short duration, and will be closely monitored by state certified teachers and a university assistant professor. Academic and behavior management skills will be the primary qualification required of the interventionists.

The dated approval stamp in the header of this consent form indicates that this project has been reviewed and approved by the Northern Arizona University Institutional Review Board (IRB) for the Protection of Human Subjects in Research. Contact the Human Research Protections Office at 928-523-4236 if you have any questions about: (1) the conduct of the project, or (2) your rights as a research participant, or (3) a research-related injury. Any other questions about the research project should be directed to:

Anthony P. Rothfork

Northern Arizona University

College of Education

Curriculum and Instruction

Office: (918) 444-3786

EMAIL: Rothfork@nsuok.edu

Faculty Sponsor:

Dr. Catherine Medina, Ph.D.

801 S. Knoles Drive

PO Box: 5774

Flagstaff, AZ 86001

Flagstaff Voice: (928) 523-2143

Cell Voice: (928) 380-8245

APPENDIX C: ASSENT FORM FOR CHILDREN

NORTHERN ARIZONA UNIVERSITY

Assent form for Research Involving Children

College of Education, 801 South Knoles Drive

PO Box: 5774

Flagstaff, AZ 86011 (928) 523-1929

Name of the Project: Does Listening to Music Have an Effect on Disruptive Behavior Among Students With Emotional Disorders

I, _____, understand that my parent or legal guardian has said it's okay for me to take part in a research project about listening to music under the direction of Anthony P. Rothfork.

I am taking part because I want to. I have been told that I can stop at any time I want to and nothing will happen to me if I want to stop.

_____ Date _____

Signature of Child

Printed Name _____

_____ Date _____

Signature of Research Representative

Printed Name: Anthony P. Rothfork

This project has been reviewed and approved by the Northern Arizona University Institutional Review Board (IRB) for the Protection of Human Subjects in Research. Contact the Human Research Protections Office at 928-523-4236 if you have any questions about: (1) the conduct of the project, or (2) your rights as a research participant, or (3) a research-related injury.

Direct any other questions about the conduct of this research project to:

Anthony P. Rothfork

Northern Arizona University

College of Education

Curriculum and Instruction

Office: (918) 444-3786

EMAIL: rothfork@nsuok.edu

APPENDIX D: SOCIAL VALIDITY

Social Validity

Intervention Rating Profile – 15 (IRP-15)

The purpose of this questionnaire is to obtain information that will aid in the selection of classroom interventions. These interventions will be used by teachers of children with behavior problems. Please circle the number that best describes your agreement or disagreement with each statement using the scale below.

1 = strongly disagree	2 = disagree	3 = slightly disagree	4 = slightly agree	5 = agree	6 = strongly agree

1. This would be an acceptable intervention for the child's problem behavior.	1 2 3 4 5 6
2. Most teachers would find this intervention appropriate for behavior problems in addition to the one described.	1 2 3 4 5 6
3. This intervention should prove effective in changing the child's problem behavior.	1 2 3 4 5 6
4. I would suggest the use of this intervention to other teachers.	1 2 3 4 5 6
5. The child's problem behavior is severe enough to warrant use of this intervention.	1 2 3 4 5 6
6. Most teachers would find this intervention suitable for the behavior problem described.	1 2 3 4 5 6
7. I would be willing to use this intervention in the classroom setting.	1 2 3 4 5 6
8. This intervention would not result in negative side effects for the child.	1 2 3 4 5 6
9. This intervention would be appropriate for a variety of children.	1 2 3 4 5 6
10. This intervention is consistent with those I have used in classroom settings.	1 2 3 4 5 6
11. The intervention was a fair way to handle the child's behavior problem.	1 2 3 4 5 6

12. This intervention is reasonable for the behavior problem described. 1 2 3 4 5 6

13. I liked the procedures used in this intervention. 1 2 3 4 5 6

14. This intervention was a good way to handle this child's behavior problem. 1 2 3 4 5 6

15. Overall, this intervention would be beneficial for the child. 1 2 3 4 5 6

APPENDIX E: EVENT RECORDING USING INTERVAL ROTATION

Subject: _____ Person Recording: _____ Date: _____

Baseline: _____ Treatment: _____

Target Behaviors: -Looking away from worksheet for 10 seconds or longer
-Talk-Out
- Out-of-Seat

	(name)	(name)	(name)	Comments
	1st 5 min	2nd 5 min	3rd 5 min	
Looking away from work (10 sec)				
Talk out				
Out of seat				

APPENDIX F: INSTITUTIONAL REVIEW BOARD APPROVAL

NORTHERN ARIZONA UNIVERSITY

Institutional Review Board for the
Protection of Human Subjects in Research

Northern Arizona University
PO Box 4087
Flagstaff, AZ 86011-4087

928-523-4348
928-523-1975 fax
www.research.nau.edu/hpsr/IRB
www.research.nau.edu/hpsr/IRB

To:	anthony rothfork, MA
From:	Donna Goldberg
Approval Date:	May 12, 2014
Project:	To what effect does listening to music have on disruptive behaviors of students with an emotional disability?
Project Number:	595427-1
Review Category/ies:	1) Research conducted in established or commonly accepted educational settings-normal educational practices.

Your research protocol has been approved by the Human Subjects Committee/Institutional Review Board (IRB) at NAU under the category of EXEMPT. This category means that your IRB approval for this project does not have an expiration date, so periodic renewal of approval is not necessary unless there are changes in your project that affect the status.

If your project **changes** in any way, you must file a Research Amendment form available at https://www.research.nau.edu/compliance/irb/forms.aspx PRIOR TO implementing any changes. You may not implement the changes until you have written approval for the change from the IRB, unless the change is necessary to eliminate immediate hazards to participants. Failure to do so will result in noncompliance and possible suspension or termination of your research project.

Any unanticipated problems or unexpected **adverse events** must be reported to the IRB within 5 business days (within 24 hours for serious adverse events) of your becoming aware of the event by filling out an Adverse Reaction or Event Reporting form (also available at website above).

As you conduct your research, please remember that:
1. Participants are volunteers or are involved in regular educational programs; they are free to withdraw from the research at any time without penalty.

2. Unless you are using existing data, Participants must be informed of the research project through written or oral explanation and must sign or approve electronically or verbally an informed consent form (for minors and children the parent or guardian must sign).

3. Unless the participants agreed to an alternative arrangement, the participants' anonymity and confidentiality must be protected. They should not be able to be identified through the responses. The presentation of the data should not put them at risk of any negative consequences. Access to the data is specified and restricted by the researcher and the department.

Additional IRB information may be found at https://www.research.nau.edu/compliance/irb/index.aspx.

APPENDIX G: PRE-INTERVENTION SOCIAL VALIDITY QUESTIONS (TEACHER)

Teacher 1982, 2014

Pre-Intervention Social Validity Questions (Teacher)

1. Do you listen to music? Yes

2. Do you think listening to music will help students focus better?

I do think music will help some students to better focus. I think it depends a lot on his/her learning style.

3. Do you think listening to music will help improve academic engagement behaviors?

Yes, I do because I have used music to help students ~~in~~ previously.

4. Do you think having the students listen to music will help you as the teacher to be more efficient and effective as a teacher?

When music helps control behaviors, then it will help me to be more effective.

5. What are your concerns about having the students listen to music before engaging in an assignment?

I do not have any concerns at this time.

6. What benefits do you see in having the students listen to music before engaging in an assignment?

It could have a calming effect that will help them to focus on the lesson rather than surroundings

7. Do you think that having the students listen to music is something you would use in the future with your students?

Yes, I am sure that I will use music in my class.

APPENDIX H: PRE-INTERVENTION SOCIAL VALIDITY QUESTIONS

(PARAPROFESSIONAL)

Aug 21, 2014
Para-Pro

Pre-Intervention Social Validity Questions (Teacher)

1. Do you listen to music? Yes

2. Do you think listening to music will help students focus better?

Yes, it would help drown out other distractions around them

3. *Do you think listening to music will help improve academic engagement behaviors?*

If used as a reward, it could help engagement behavior

4. Do you think having the students listen to music will help you as the teacher to be more efficient and effective as a teacher?

Maybe, If used a proper tool it should help but I'm not sure how much it would help

5. What are your concerns about having the students listen to music before engaging in an assignment?

My concern is that the students will focus on Songs instead of doing assignments.

6. What benefits do you see in having the students listen to music before engaging in an assignment?

It would help them focus better, put them in a proper mood to learn, and help with discipline issues

7. Do you think that having the students listen to music is something you would use in the future with your students?

If it worked I would. But each class & students are different so it would be hard for me to say yes

APPENDIX I: TEACHER INTERVIEW QUESTIONS (POST INTERVENTION, TEACHER)

Teacher Interview Questions (Post Intervention) Name: __

1. Do you approve of the students listening to music before beginning their work? Yes, it took time for the students to get used to the routine but it seemed to help after a while.
2. Do you think having the student listen to music helps them be able to focus better? Yes for most students.

3. Do you think the students were more confident in being able to do their work after listening to music?
I think that it helped them to focus which helped them to do their work more effectively so that builds confidence.

4. Do you think it was better, worse, or equal to beginning independent work the usual way?
Somewhat better.

5. What do you like most and least about having the students listen to music before beginning an assignment? I liked the music for the focus but just getting into the routine was difficult.

6. *Would you have your students listen to music again before starting an assignment?* I would, in some form use ~~Mus~~ music and will before starting and during independent work.

7. Would you consider playing music to teach or reinforce behaviors or other academic skills?
Yes, I think the appropriate music helps many students learn.

APPENDIX J: TEACHER INTERVIEW QUESTIONS (POST INTERVENTION, PARAPROFESSIONAL)

Teacher Interview Questions (Post Intervention) Name: _____

1. Do you approve of the students listening to music before beginning their work? Yes

2. Do you think having the student listen to music helps them be able to focus better? yes

3. Do you think the students were more confident in being able to do their work after listening to music?
I'm not sure if they were or not.

4. Do you think it was better, worse, or equal to beginning independent work the usual way?
equal

5. What do you like most and least about having the students listen to music before beginning an assignment? I like that it gave them a chance to focus on something else before working on an assignment.

6. *Would you have your students listen to music again before starting an assignment?* Yes

7. Would you consider playing music to teach or reinforce behaviors or other academic skills?
yes

APPENDIX K: SOCIAL VALIDITY (IRP-15, TEACHER)

Social Validity

Intervention Rating Profile – 15 (IRP-15)

The purpose of this questionnaire is to obtain information that will aid in the selection of classroom interventions. These interventions will be used by teachers of children with behavior problems. Please circle the number that best describes your agreement or disagreement with each statement using the scale below.

1 = strongly disagree 2 = disagree 3 = slightly disagree 4 = slightly agree 5 = agree 6 = strongly agree

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

APPENDIX L: SOCIAL VALIDITY (IRP-15, PARAPROFESSIONAL)

Social Validity

Intervention Rating Profile – 15 (IRP-15)

The purpose of this questionnaire is to obtain information that will aid in the selection of classroom interventions. These interventions will be used by teachers of children with behavior problems. Please circle the number that best describes your agreement or disagreement with each statement using the scale below.

1 = strongly disagree | 2 = disagree | 3 = slightly disagree | 4 = slightly agree | 5 = agree | 6 = strongly agree

1. This would be an acceptable intervention for the child's problem behavior. 1 2 3 4 (5) 6
2. Most teachers would find this intervention appropriate for behavior problems in addition to the one described. 1 2 3 4 (5) 6
3. This intervention should prove effective in changing the child's problem behavior. 1 2 3 (4) 5 6
4. I would suggest the use of this intervention to other teachers. 1 2 3 (4) 5 6
5. The child's problem behavior is severe enough to warrant use of this intervention. 1 2 3 4 (5) 6
6. Most teachers would find this intervention suitable for the behavior problem described. 1 2 3 (4) 5 6
7. I would be willing to use this intervention in the classroom setting. 1 2 3 (4) 5 6
8. This intervention would *not* result in negative side effects for the child. 1 2 3 4 (5) 6
9. This intervention would be appropriate for a variety of children. 1 2 3 4 (5) 6
10. This intervention is consistent with those I have used in classroom settings. 1 2 3 4 (5) 6
11. The intervention was a fair way to handle the child's behavior problem. 1 2 3 (4) 5 6
12. This intervention is reasonable for the behavior problem described. 1 2 3 (4) 5 6

13. I liked the procedures used in this intervention. 1 2 3 4 5 6

14. This intervention was a good way to handle this child's behavior problem. 1 2 3 4 5 6

15. Overall, this intervention would be beneficial for the child. 1 2 3 4 5 6

APPENDIX M: STUDENT INTERVIEW QUESTIONS (POST INTERVENTION)

Student Interview Questions (Post Intervention) Name:

1. Did you like listening to music? yes

2. Did you feel more comfortable doing your work after listening to music? yes

3. Did listening to music help you to be able to focus on your work better? no
   a. If it did, how do you think it helped? [illegible]

   b. If it did not, why do you think it did not? it makes me learn less

4. What did you like best about being able to listen to music before working? be able to listen to it.

5. What was the worst thing about listening to the music before working? it keep repeating.

6. Would you like to be able to listen to music before beginning work in your other classes? yes

Student Interview Questions (Post Intervention) Name: _____

1. Did you like listening to music? Yes

2. Did you feel more comfortable doing your work after listening to music? Yes

3. Did listening to music help you to be able to focus on your work better?
   a. If it did, how do you think it helped? I can't explain

   b. If it did not, why do you think it did not?

4. What did you like best about being able to listen to music before working? Relax

5. What was the worst thing about listening to the music before working? Nothing

6. Would you like to be able to listen to music before beginning work in your other classes?
   Yes

9-12-14

Student Interview Questions (Post Intervention) **Name:** _____

1. Did you like listening to music? Yes, I did

2. Did you feel more comfortable doing your work after listening to music? Yes
I can relax after the session
music

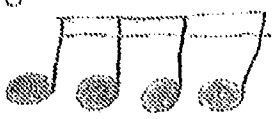
3. Did listening to music help you to be able to focus on your work better? Yes it did
   a. If it did, how do you think it helped? It helped me
focus before, I work on my math

   b. *If it did not, why do you think it did not?* _____

4. What did you like best about being able to listen to music before working? I
liked the instruments

5. What was the worst thing about listening to the music before working? I didn't
like the loud beats

6. Would you like to be able to listen to music before beginning work in your other classes?
Yes I am having a bad day



Student Interview Questions (Post Intervention) Name: _____

1. Did you like listening to music? NOPE

2. Did you feel more comfortable doing your work after listening to music? No

3. Did listening to music help you to be able to focus on your work better?
   a. If it did, how do you think it helped?

   b. *If it did not, why do you think it did not?* No, I Didn't like

4. *What did you like best about being able to listen to music before working?* it gave a break from work

5. What was the worst thing about listening to the music before working? I didn't like to listen to that kind of music

6. Would you like to be able to listen to music before beginning work in your other classes?
   NO

9-12-14

Student Interview Questions (Post Intervention) **Name:** _____

1. Did you like listening to music? I didn't like it, I loved it.

2. Did you feel more comfortable doing your work after listening to music? Kinda sorta.

3. Did listening to music help you to be able to focus on your work better? Definetly
   a. If it did, how do you think it helped? It's very soothing

   b. If it did not, why do you think it did not? I don't know

4. What did you like best about being able to listen to music before working? very classical

5. What was the worst thing about listening to the music before working? Nothing

6. Would you like to be able to listen to music before beginning work in your other classes?
   yes