2019

Music Therapy Effects on Social-Communicative Response of Children with Autism Spectrum Disorder

Raymond Payton
Walden University

Walden University

College of Education

This is to certify that the doctoral study by

Raymond Payton Jr.

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. David Weintraub, Committee Chairperson, Education Faculty
Dr. Mary Hallums, Committee Member, Education Faculty
Dr. Nicolae Nistor, University Reviewer, Education Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2019

Abstract

Music Therapy Effects on Social-Communicative Response of Children with Autism Spectrum Disorder

by

Raymond Payton Jr.

MEd, New Jersey City University, 2004

MEd, William Paterson University, 2002

BS, Fairleigh Dickinson University, 1997

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

April 2019

Abstract

Children diagnosed with Autism Spectrum Disorder (ASD) are challenged with communicative skills, which can negatively influence their emotional development. As children with ASD in the local school were not demonstrating functional communication skills as measured by the Assessment of Social Skills for Children with Autism (ASSCM), music therapy was introduced as remediation. The purpose of this study was to determine the extent to which music therapy increased the ASSCM scores. This single subject design study was guided by Bronfenbrenner's ecological theory, which holds that individuals are impacted by various environmental systems around them. The research question addressed the extent to which 9 weeks of music therapy increased ASSCM scores of 6 children with ASD that participated in weekly music therapy. The deidentified secondary data showed initial ASSCM scores were 32 on a scale from 30 to 90. The scores of the 6 students that attended the weekly music therapy increased by 36 points. The Percentage of Data Points Exceeding the Median (PEM) effect size used in single subject studies to determine potential statistically significant performance improvement over time was 100%, meaning that all students exceeded the median pretest score. A professional development program was designed to assist the school district's special education teachers in the use of music therapy. Positive social change implications may include the ability for children with ASD to communicate with their peers and hence, integrating them into the classroom and school environment. After all, school is not only about learning academic subjects but an opportunity to interact and function in a social setting, increasing the social and emotional well-being of children.

Music Therapy Effects on Social-Communicative Response of Children with Autism Spectrum Disorder

by

Raymond Payton Jr.

MEd, New Jersey City University, 2004

MEd, William Paterson University, 2002

BS, Fairleigh Dickinson University, 1997

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

April 2019

Dedication

I would like to dedicate this doctoral study to my wife and family. Their support and love have encouraged and helped me remain focused during times of challenges. Thank you all. I love with all my heart and soul.

Acknowledgments

I would like to take to opportunity to express my gratitude to my parents, Michele and Raymond Payton Sr. Thank you for teaching me always to be diligent and for believing in me. You always modeled and instilled hard work always pay off and this is something I hope to pass on to my daughter. Without the many long and insightful conversations, I would not be able to complete this journey. Thank you to my siblings, James and Monique Cleveland for your love and support throughout my life.

To my wife, Jennifer, you have always been that constant support for me and helped shape me into the person I am today. I have been blessed to have you not only as my wife but as a best friend and I'm thankful for your love and companionship. You have permitted me the opportunity to take the time to many days and weekends to complete my work. You have been the support for the family giving and keeping things on track and together in my absences.

To my daughter, Mia Rae, you have been the light of my life and the most beautiful gift in my life. I thank God for you each day of my life. You complete me and give me the inspirational boost I need when I needed it.

Several professional associates deserve great thanks for guiding me in arriving at my destination. First, special gratitude goes to Dr. Weintraub, my doctoral chair, who continually provided direction and guidance. He remained positive throughout this process. Very special thanks to Dr. Hallums who accompanied me on this journey as my dissertation committee. I will be forever grateful for your feedback, guidance, and words of wisdom throughout the process.

Table of Contents

List of Tables v

List of Figures vi

Section 1: The Problem 1

Local Problem 1

Rationale 2

Purpose of the Study 4

Definition of Terms 4

Significance of the Study 5

Research Question and Hypotheses 6

Review of the Literature 7

Introduction 7

Theoretical Foundation 8

An Overview of Autism Spectrum Disorder 9

Specific Communication Challenges 10

Benefits of Music Therapy with Autism Spectrum Disorder Children 14

Implications 26

Summary 27

Section 2: The Methodology 29

Research Design and Approach 29

Setting and Sample 30

Instrumentation and Materials 31

Music Therapy Intervention 31

Data Collection and Analysis....33
Data Analysis Plan....34
Threats to Validity....35
Assumptions, Limitations, Scope, and Delimitations....37
Protection of Participants' Rights....37
Data Analysis Results....38
Participant 1....39
Participant 2....40
Participant 3....40
Participant 4....41
Participant 5....42
Participant 6....43
Section 3: The Project....46
Introduction....46
Description and Goals....47
Rationale....48
Review of the Literature....49
Theoretical and Conceptual Frameworks....50
Professional Development for Teachers....52
Professional Development and Training for Integrating Music Therapy Interventions....54
Empirical Results of Professional Development and Training Programs....60
Project Description....65

Needed Resources 65
Potential Barriers 67
Proposal for Implementation and Timetable 67
Roles and Responsibilities of Administrators, Teachers, and Others 68
Project Evaluation Plan 69
Project Implications 70
Section 4: Reflection and Conclusions 71
Introduction 71
Project Strengths 71
Limitations 72
Recommendations for Alternative Approaches 73
Scholarship, Project Development and Leadership and Change 74
Scholarship 74
Project Development 75
Leadership and Change 75
Analysis of Self as Scholar 76
Analysis of Self as Practitioner 77
Analysis of Self as Project Developer 78
Reflection on the Importance of the Work 79
Implications, Applications, and Directions for Future Research 80
Implications for Social Change 80
Future Research and Applications 81
Conclusion 81

References 83

Appendix A: The Project 83

Appendix B: Timeline of Procedures and Music Therapy Program 129

Appendix C: List of Music Therapy Songs 130

Appendix D: Music Therapy Lesson Plan 131

Appendix E: Approval Letter 132

Appendix F: Approval Letter 132

Appendix F: Authorization to use the Assessment of Social Skills for Children with Autism 134

Appendix G: Walden Institutional Review Board Approval Number 135

List of Tables

Table 1. Timeline of Procedures 35

Table 2. Summary Statistics for Communication Scores 50

List of Figures

Figure 1. Line plot of communication scores for Participant 1…….39

Figure 2. Line plot of communication scores for Participant 2…….40

Figure 3. Line plot of communication scores for Participant 3…….41

Figure 4. Line plot of communication scores for Participant 4…….42

Figure 5. Line plot of communication scores for Participant 5…….43

Figure 6. Line plot of communication scores for Participant 6…….44

Section 1: The Problem

Local Problem

Autism spectrum disorder (ASD) is the term used for a collection of compound disorders of brain development. These disorders can run a range of difficulties in social interactions and verbal and nonverbal communication often manifested in repetitive behaviors. No two autistic individuals are alike. The prevalence of cases of autism is due to improved diagnosis and awareness. As of 2014, 1 in 68 children were diagnosed autistic, with boys being 5 times more likely to be classified autistic than girls (Centers for Disease Control and Prevention [CDC], 2014). Exposure to music therapy techniques may aid them in their overcoming the various developmental challenges they experience daily. Music therapy is one tool used to help ASD children develop their communication skills.

School district personnel are faced with the challenge of addressing the needs of autistic children in classroom settings. Staff must provide instruction addressing standards while ensuring that these children become equipped with the knowledge and skills they will need to be successful once they leave school. The absence of functional communication skills, both verbal and nonverbal or prelinguistic, has been identified by the literature as essential to success both within and outside of the classroom. Being able to intermingle with and relate to other people is the foundation for a person to fit into society and to develop relationships according to Ferraioli and Harris (2011).

According to Autism Research Institute (2017), the rate of autism diagnoses has continued to grow over the last 20 years with approximately 40% of these children unable

to speak. Children with ASD manifest decreased social interactions (Carpenter & Tomasello, 2000; Volkmar & Klim, 1994); they generally do not actively interact with others nor respond to others' efforts to share interest or attention (Carpenter & Tomasello, 2000). According to the National Institute on Deafness and Other Communication Disorders(2017), some children with ASD have difficulty communicating using speech or language, with many having very limited speaking skills.

As is the case with most children with ASD, the children in the local school district with ASD have problems with communication skills. According to the Department of Special Services at the local research site, the number of students diagnosed with autism has risen from 76 in the school year 2013-2014 to 135 in the school year 2016-2017 as evidenced by the district-wide enrollment numbers. Due to ASD children returning to the district from an out-of-district program, the local district is looking for new ways to improve the techniques that special education teachers can use to enhance instruction with ASD children. I am hypothesizing that generating new and potentially more music therapy for autistic children will lead to improvement in their communication skills.

Rationale

According to the supervisor of special services (personal communication, September 26, 2016), the district is currently seeking new ways to assist special needs students with their communication skills. The district noted that they are using proven interventions, such as assistive technology and a picture exchange communication system (PECS), which have been shown to help many on the autism spectrum in their attempt to

communicate and mix with other people. Due to this situation, educators increasingly have turned to augmentative or alternative communication (Frea, Arnold, & Vittimberga, 2001). The PECS is one of such augmentative communication systems designed to increase functional communication skills and potentially provide a bridge to speech acquisition. The PECS has been noted in the literature by a small number of case studies and a large body of anecdotal literature (Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002). A number of district administrators have reported that communication skills are the most important skill to allow ASD students to be understood by others according to the supervisor of special services (personal communication, September 26, 2016). In addition, speech therapists have provided data through evidence from Clinical Evaluation of Language Fundamentals®-Fifth Edition (CELF-5 Screening Test), an in-district assessment that measures the social and communication skills of ASD children. The CELF-5 was created to assess a student's language skills in a variety of settings. It is also used to determine the existence of a language disorder, describe the nature of that disorder, and plan for any intervention or treatment.

The information I collected in this study can be used to assist local district administrators in preparing ASD children to effectively communicate and succeed in reaching desired educational benchmarks. The improved communication with children may allow educators to gain a deeper connection to them, thus providing insight into their academic and emotional needs. This may help teachers choose which techniques are most effective to improve the communicative responses of students with ASD.

Purpose of the Study

The purpose of the study was to determine if one marking period (9 weeks) of music therapy increases communication skills of ASD students as measured by the Assessment of Social Skills for Children with Autism (ASSCM). This instrument provides a variety of questions to guide teachers in observing children in the areas of verbal and nonverbal social communication skills (Quill, Norton Bracken, & Fair, 2000). The authors' goal was to examine the potential influence of environmental factors on language performance by designing the use of hypothetical tasks under natural observation. The performance of children with ASD has been shown to improve when clear expectations and predictable interactions have been established (Quill et al., 2000).

The number of students with ASD in the central New Jersey suburban township public school district has increased in the past 3 years according to the director of special services (personal communication, August 2017). According to Realtime Student System, data from 2015–2016 indicated that the enrollment for ASD children has increased from 127 students to 136 students within the past 3 years. These students need to be evaluated for them to have an inclusive educational experience in their school community.

Definition of Terms

Autism spectrum disorder (ASD): A multifaceted developmental disability. Manifestations typically appear in early childhood and affect a person's capability to communicate and socialize with others (National Autistic Society, 2015).

Individualized Educational Plan (IEP): a document that is developed for each public school child who needs special education services. An IEP is a plan for teachers,

parents, school administrators, special services personnel, and students to collaborate to improve educational results according to the requirements of the Individuals with Disabilities Education Act of 1997.

Music therapy: The use of musical experiences such as instrumental and vocal performance to assist individuals to communicate and to express their feelings (Geretsegger, Holck, Bieleninick, & Gold, 2016).

Significance of the Study

The study is significant as it can provide details regarding whether the use of music therapy increases communication for children diagnosed with ASD. Children with this disorder need effective ways to communicate to assist them with daily communication and their relations with peers (Geretsegger et al., 2016). This study is critical because the information can be used for treatment and therapy to assist with effective communication skills and possible solutions for teachers, parents, and children diagnosed with this disorder. In addition, this may help local and other special education teachers with effective methods of teaching communication skills to children on the spectrum.

Geretsegger et al. (2014) and James et al. (2015) suggested that the daily use of music therapy for children diagnosed with autism can be beneficial for them regarding their ability to function within the school environment. However, additional research is needed to assess the specific benefits of improving communications (such as verbalizations and eye contact) using a music therapy approach with children identified with ASD. Finnigan and Starr (2010) found that music therapy promoted greater social

engagement behaviors from the autistic child. As engagement behavior is an important component of both verbal and nonverbal communication, Finnigan and Starr's findings suggest that music therapy improved the overall communication capacities of autistic children.

Positive social change implications of this study include contributing specific knowledge to educators and school administrators about the benefits of music therapy. For example, if the data analysis shows a student struggles with mastery of eye contact, the teacher may find additional classroom opportunities to support the ASD student in this area. Reinforcement in specific communication areas will provide the child with lifelong skills that will impact the child's success in future endeavors.

Music therapy may contribute to increasing social adaptation skills in children with ASD and promote the quality of parent/child relationships. Thompson, McFerran, and Gold (2014) supported that taking music therapy activities in the family home can successfully support the family-centered agenda. Thompson et al. found music therapy has a positive effect of on social communication skills among young people with ASD diagnoses with parents.

Research Question and Hypotheses

Based upon the local problem, the purpose statement, and gaps in practice, the following quantitative research question was structured to investigate the effect of music therapy on ASD children related to their social-communicative skills.

RQ: What is the difference in the change in communication skills as measured by (ASSCM) between those ASD students who participated in 9 weeks of music

therapy and those who did not?

H_0: There is no significant difference in the change in communication skills between ASD students who did and did not participate in music therapy for 9 weeks.

H_a: There is a significant difference in the change in communication skills between ASD students who did and did not participate in music therapy for 9 weeks.

Review of the Literature

Introduction

The purpose of this literature review is to describe, evaluate, and critically synthesize both theories and empirical studies related to the possible effects of music therapy to improve the communicative skills of autistic school children. The literature review has been divided into four subsections. The first section contains an overview of communication challenges in children with ASD. The second section provides theories and findings relevant to the application of music therapy to ASD children will be considered. The third section presents empirical findings on the effectiveness of music therapy on ASD children's communication skills. Finally, gaps in the literature are identified. A brief conclusion contains a summary of the main points of the literature review.

The discussion of communication challenges in ASD children has been divided into two portions. First, I have provided an overview of ASD. Second, I highlight and discuss specific communication challenges among ASD children.

Theoretical Foundation

A theoretical framework provides the link between theories that support the area of research and the specific study. Theories are designed to explain, predict, and understand phenomena such as relationships, events, or behaviors (Marshall & Rossman, 2016). Music therapy uses multiple modalities to increase communication. Theoretical growth of music therapy can be analyzed through multiple theories and disciplines (Bruscia, 2012). The relationship between human beings and music continues to evolve today. Music does not only serve as a profession or as a hobby, but it is also a vehicle towards personal development, social inclusion, cultural understanding, well-being, and human fulfillment (Hildén et al, 2010).

The absence of a universally accepted theoretical framework to explain the success of music therapy is more of a testament to the limitations of the still-developing field of neuroscience than to the limitations of music therapy itself. Numerous scholars have argued that neuroscience is not yet sufficiently developed to explain the physiological basis of positive response to music therapy, whether in individuals with ASD or in larger populations (Raglio et al., 2016; Ueda, Suzukamo, Sato, & Izumi, 2013). However, the existence of empirical evidence of the positive link between music therapy and outcomes such as improved communication among ASD-diagnosed individuals suggests that decision-makers need not wait for the elucidation of a neuroscientific theory of music therapy before implementing this modality in schools and other settings.

An Overview of Autism Spectrum Disorder

Autism is a disorder that appears among roughly 1.5% of the global population, which gives rise to several challenges in the context of classroom management and educational policy (Blood, Blood, Coniglio, Finke, & Boyle, 2013; Bouck, Satsangi, Doughty, & Courtney, 2014; Ferraioli & Harris, 2011; Hopkins et al., 2011; Lee & Carter, 2012). Autism has been defined by the American Psychiatric Association (APA) in that organization's *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.) in terms of three sets of deficits, each of which is directly or indirectly related to communication. The first two deficits concern verbal and nonverbal communication, and the third deficit pertains to relationship quality. These first two deficits are defined by the APA as follows:

> Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication (APA, 2013, p. 299).

Based on the APA's definition of ASD, communication deficits are characteristic of this disorder. ASD was first used to describe people who appeared uninterested in other people and relationships and exhibited compromised communication ability (Schreibman

& Stahmer, 2014). Recent data shows that 30% to half of youngsters with autism show a delay in functional speech. Functional speech incorporates communicating needs, taking part in the sharing of an action, and partaking in discussion with other individuals (Low & Lee, 2011). Therefore, there is a rationale for educational policy-makers to explores a means of improving the communicative skills of ASD-diagnosed students in particular.

Specific Communication Challenges

There are numerous communication challenges that occur in the context of ASD children. One such challenge that is purely physiological in nature is related to the auditory processing capabilities of ASD children. A meta-analysis conducted by Chin, Kraus, Lynch, and Magee (2012) indicated that on the basis of evidence accumulated from dozens of studies conducted from 1965 onwards, ASD children have two distinct auditory deficits: (a) deficits in the physiological apparatus of hearing, and (b) deficits in the neural processing of sound. Thus, there are two distinct, but ultimately complementary, hearing-related challenges confronted by ASD children. Because ASD children are likely to have problems in their middle-ear structures and related auditory mechanisms, they often have mechanical hearing problems that render them either harder of hearing or hypersensitive to sound.

In addition to this purely physiological problem, ASD children also face problems related to auditory processing. Auditory processing is distinct from hearing itself. For example, if the mechanical structure of a child's ear shows no imperfections, the child will not necessarily have hearing problems, but because of neural deficits, the child might not be able to properly encode or interpret what is heard (O'Connor, 2012). The existence

of both mechanical and process-related hearing deficits in ASD children has important implications for communication. First, it is likely to be true that many ASD children cannot hear properly or are hypersensitive in their hearing. Thus, from a purely mechanical point of view, it is more difficult for ASD children to hear others (or even to hear music). The existence of hearing deficits means that ASD children are not as able to absorb the kind of auditory information that is necessary for truly interactive, spoken communication. Some individuals with ASD have sensory related auditory behaviors that range from hypersensitivity to sound phonophobia or distress caused by certain sounds, as well as restricted interest or hyposensitivity to specific sounds (Ludlow et al., 2014) and specific difficulty with processing speech sounds (O'Conner, 2012).

In addition to the ASD communication challenges posed by problems related to mechanical hearing and auditory processing, there are also communication challenges rooted in the characteristics of ASD itself. ASD children tend to have difficulty engaging in social contact (Berney, 2014). Children on the extreme end of the spectrum might not be able to make eye contact, and they might engage in heavily standardized communication behavior (such as recitations of bus arrival times or other information of idiosyncratic value) rather than engage in true interaction with others. Their lives become characterized by a routine, rigid, and systematic approach. For such children, attempts by others to make social contact can be highly uncomfortable. On the other hand, children who are on the moderate and mild continuum of ASD are likely to be more receptive to traditional attempts at communication. Given the substantial variation that exists within the ASD diagnosis, the intensity of communication challenges is also likely to vary

depending on the specific characteristics (Watson et al., 2013) and constraints of the child in question.

In some cases, ASD children are resistant to communication itself. In other cases, behaviors associated with ASD might result in a form of emotional disturbance that manifests itself in hostile communication. Common symptoms of autism are the areas concerning difficulties in communication, which can lead to feelings of frustration and confusion. Children may manifest these with loud behavioral responses (Anderson & Morris, 2006). ASD children, becoming frightened or upset by the communication of others, can withdraw, but they can also lash out verbally and behaviorally. Thus, in considering the problem of ASD communication, attention should be paid not only to the difficulties of such children in hearing, processing, and producing such communication, but also to the underlying behavioral dimension that, in some children, can transform communication into a tense or hostile activity. To express their behavior, some individuals diagnosed with autism manifest their wants and desires through behaviors rather than words (Armstrong, DeLoatche, Preece, & Agazzi, 2014).

The existence of such hearing deficits is not only a problem for communication in general (Szymanski, Brice, Lam, & Hotto, 2012) but also for music therapy. Given the hearing problems of ASD children, music therapy must draw upon music that is appropriate in volume in terms of neither activating hypersensitivity nor being below the threshold of hearing for ASD children. Many individuals with ASD have problems with the patterns or rhythms in speech, as well as lacking the ability to perceive pitch and in music (McCann, Peppe, Gibbon, O'Hare, & Rutherford 2007).

Music Therapy and Autism Spectrum Disorder Children

Music therapy has been suggested as an effective intervention for ASD children (Accordino, Comer, & Heller, 2007; Boso, Emanuele, Minazzi, Abbamonte, & Politi, 2007; Kim, Wigram, & Gold, 2008, 2009). There are several empirical studies that have provided proof for the existence of a positive relationship between music therapy and the easing of ASD symptoms (Boso et al., 2007; Kim et al., 2008, 2009). Various theoretical explanations have been advanced to explain the empirical research base. One explanation of the efficacy of music therapy is that this modality is associated with lower cortisol secretion (Bartlett, Kaufman, & Smeltekop, 2014). As the secretion of cortisol is associated with stress, it is possible that reducing cortisol secretion places individuals in a calmer state of mind, one that is more conductive to communicating (Bartlett et al., 2014). Other scholars have attempted to explain the effectiveness of music therapy in more psychological than neurophysiological terms. For example, music therapy has been described as providing improved emotional modulation, which is another factor in successful communication (LaGasse, 2014). It is possible that such emotional effects can be traced to an effect of music therapy on the function of the amygdala (Manno, Fernandez-Ruiz, Barrios, 2017).

Numerous scholars have argued that neuroscience is not yet sufficiently developed to explain the physiological basis of positive response to music therapy, whether in individuals with ASD or in larger populations (Raglio et al., 2012; Raglio et al., 2016; Ueda et al., 2013). Based on the literature noted, I believe that the existence of empirical evidence of the positive link between music therapy and outcomes, such as

improved communication among ASD-diagnosed individuals, suggests that decision-makers need not wait for the elucidation of a neuroscientific theory of music therapy before implementing this modality in schools and other settings.

Benefits of Music Therapy with Autism Spectrum Disorder Children

Before proceeding to a review of relevant empirical studies on the impact of music therapy on communication in ASD children, I will summarize the seminal and recent literature on how and why music therapy might work in such in a context. Five proven benefits of music therapy literature are (a) music provides an engaging stimulus, (b) music assists in emotional regulation, (c) music assists in stress reduction, (d) music reduces negative behaviors, and (e) music improves attentional skills. It is possible that these benefits of music therapy are somehow related to each other or to other variables, but it is also unknown precisely why music therapy should work in the manner than it apparently does. However, there are some salient suggestions in the literature.

Music therapy and stimuli. Scientists have found that humans are born hard-wired for music (Martin, 2014; Taheri, Jahromi, Abbasi, & Hojat, 2017). Even the youngest babies can recognize and respond to changes in rhythm, and the sound of the mother's heartbeat is one of the many stimuli that primes the fetus (assuming no deficits in mechanical hearing or auditory processing) for the subsequent appreciation of music across the human lifespan (Martin, 2014; Taheri et al., 2017). As a stimulus, music is closely associated with mood. In particular, the characteristics of music (such as volume, harmony, and pitch) can exert a causal impact on the subjective state of the listener.

For this reason, music therapy has often been applied to children and adults who have behavioral or communication problems. In the case of autistic children, music is of particular interest as a stimulus because autistic children are often excellent at identifying patterns (Kalas, 2012; LaGasse, 2014). For a child with ASD, music might represent a stimulus that is more interesting than human speech, because music might have qualities of pattern, repetition, and structure that align well with ASD children's need for predictable input. In this sense, music therapy might prime ASD children for exposure to other, less structured kinds of stimuli, such as the stimulus of human speech (Kalas, 2012; LaGasse, 2014).

A metareview of the literature on music therapy and autism carried out by Accordino et al. (2007) provided further insights into how and why music therapy might be particularly effective for individuals with ASD diagnoses. One of the strengths of this metareview was the sorting of effects into different categories for communicative abnormalities and other kinds of abnormalities. In terms of communicative abnormalities, Accordino et al. identified several mechanisms for the effectiveness of musical therapy. These mechanisms include the beneficial effect of modeling novel sounds, particularly in terms of breaking resistance to communication among ASD-diagnosed students.

Music therapy and emotional regulation. The documented link between music and mood means that music therapy can be utilized in emotional regulation (Koelsch, 2015; Strehlow & Lindner, 2016). For such a purpose, the music chosen for therapy must possess certain characteristics; not all music is equally suited to the task of promoting emotional regulation, and some kinds of music can actually promote emotional

dysregulation (Koelsch, 2015; Strehlow & Lindner, 2016). As discussed earlier in the literature review, ASD children can struggle with emotional regulation, and for some children, emotional dysregulation could be the primary factor in their communication difficulty. For such children in particular, exposure to music therapy could be a means of inculcating habits of emotional regulation that can be subsequently exercised in the context of social communication.

This point applies, not merely to emotional regulation in general, but also to stress reduction in particular. ASD children can feel a great deal of stress, not only because of social adjustment problems but because of the nature of ASD itself (Hirvikoski & Blomqvist, 2015). The subjective experience of ASD includes a substantial component of stress—stress that the ASD child attempts to soothe by means such as avoiding social contact, creating highly structured activities, and building a closed-off inner world (Hirvikoski & Blomqvist, 2015). Insofar as music therapy can be utilized to decrease this stress, ASD children, among others, might be better equipped to engage in communication without having to manage high amounts of stress at the same time (Koelsch, 2015; Strehlow & Lindner, 2016).

In another study, therapists attempted to identify possible reasons for the efficacy of music therapy among individuals with ASD (Kim et al., 2009). In this study, which was also a randomized controlled trial (RCT), participants were randomly assigned to either a music therapy group or a group in which standard play therapy was used. Afterwards, therapists who had been blinded to the group membership of the participants in this RCT were asked to rate participants on the measures of joy, emotional

synchronicity, and initiation of engagement. It was found that participants in the music therapy group were significantly more likely to have longer episodes of joy and emotional synchronicity. The music therapy participants were also more likely to initiate engagement. These findings suggested that the mechanism through which music therapy might act positively on the communication skills of ASD-diagnosed individuals is one of emotional modulation, although, as Kim et al. (2009) acknowledged, additional study is required to identify what kinds of modulation are affected and what the neurophysiological correlates of these kinds of modulation might be.

Music therapy and stress reduction. Music can reduce negative behavior through the mechanisms of stress reduction and mood control (Hirvikoski & Blomqvist, 2015; Kalas, 2012; Koelsch, 2015; LaGasse, 2014; Strehlow & Lindner, 2016). Individuals who placed into a calmer state by music are less likely to engage in hostile behavior (Hirvikoski & Blomqvist, 2015; Kalas, 2012; Koelsch, 2015; LaGasse, 2014; Strehlow & Lindner, 2016). This effect has been documented in the case of violent prisoners and other test subjects of all ages and conditions (Hirvikoski & Blomqvist, 2015; Kalas, 2012; Koelsch, 2015; LaGasse, 2014; Strehlow & Lindner, 2016). Indeed, the effect is so well known that, William Congreve wrote that “music has charms to soothe the savage breast” In this sense, music’s therapeutic influence on behavior has been understood for centuries or perhaps millennia before being confirmed through contemporary experimental methods.

Boso et al. (2007) conducted a study of the effects of music therapy on two measures of autism, the Clinical Global Impression scale (CGI) and the Brief Psychiatric

Rating Scale (BPRS). The CGI and BRPS are often used as tools to measure the efficacy of therapies for anxiety disorders (Zaider et al., 2015). The music intervention was interactive, as ASD-diagnosed young adults recruited into the study were asked to engage in singing, piano playing, and drumming. Boso et al. found that participants improved significantly in both their CGI and BPRS measures. However, this finding was limited by the fact that the same raters assessed students at the beginning and end of the intervention. It is possible that, because of the raters' latent desire to see their experimental subjects succeed, bias entered into the post-intervention CGI and BPRS rankings. Although the raters were psychiatrists who were not present at Boso et al.'s experiment, they did know about the experiment. Thus, Boso et al. ought to have included a control group and asked the raters to enter blind ratings—that is, ratings not influenced by knowledge of whether or not a particular subject was exposed to music therapy. In addition, the fact that Boso et al.'s sample consisted of only eight individuals meant that the study lacked generalizability and statistical power. Finally, even though CGI and BPRS contain items related to communication, communication was not a distinct dependent variable in this empirical study. Having acknowledged these limitations, it should also be acknowledged that Boso et al.'s results suggest a positive linkage between music therapy and improve in ASD-diagnosed individuals' communicative capabilities.

One point of concern in evaluating the usefulness of music therapy for autism is whether music therapy is superior to other forms of care or therapy (Bieleninik et al., 2017). The study conducted by Bieleninik et al. addressed this concern. These researchers

conducted a randomized clinical trial on the effects of music therapy (specifically, improvisational music therapy) on the autism symptom severity of children over 5 months. Enhanced standard care versus the same level of care in addition to a plan of improvisational music therapy was attempted in a 1:1 ratio. Enhanced standard care was defined as the normal local treatment of patients in additional to parental education about ASD. The improvisational music therapy incorporated the use of trained music therapists who sang or played music with each child. These therapists focused the specific songs to the child's level of attention, thus helping them develop to sharing and join in musical activities.

Based on this finding, Bieleninik et al. (2017) argued that music therapy and enhanced care were equally effective at reducing autism symptoms. However, this article was limited by the fact that communication outcomes were not measured separately, but, rather, as part of the Autism Diagnostic Observation Schedule. It is possible that, if the results were presented separately for different symptom types, autistic children in the music therapy group might have obtained superior improvements in communication versus the improvements recorded for the enhanced care group.

Music therapy and reduction in negative behaviors. Many children with autism often exhibit random or repetitive body movements (hand-flapping, body-rocking, spinning or flipping of objects) and repetitive vocal sequences (Kalas, 2012). These behaviors can easily interfere with a child’s learning environment and thereby his or her optimal development (Armstrong et al., 2014). These behaviors can present themselves in self-stimulatory behaviors (i.e. stereotypically flapping or rocking) but can also present

itself in more discrete manners and are not limited to anxiety, obsessive compulsiveness, inattention, non-compliance and at times aggression (APA, 2013).

Music therapy and attentional skills. Music and music therapy are generically associated with the development of attentional skills (Kalas, 2012; LaGasse, 2014). One of the characteristics associated with ASD is related to attention. Attentional disabilities in children with ASD may include a preference for nonsocial over social signals (Dawson et al, 2014), difficulty disengaging attention (Maestro, Murator, Cavallaro, Pei, & Stern, 2013), and poor sharing of attention with others (Reichow & Volkmar, 2014).The stimulus of music improves attentional skills, partly as a result of the human evolutionary capability for pattern detection and appreciation (Kalas, 2012; LaGasse, 2014). Structured music contains patterns, and the existence of these patterns in the form of an aural stimulus presents ASD children with a focal point for attention that is more easily squandered on less-structured communication social communication (Kalas, 2012; LaGasse, 2014).

A study conducted by Kalas (2012) measured the impact of music therapy on the attention span of 30 autistic children. In Kalas' experimental design, the chosen music was subdivided into types of music: simple and complex. Interestingly, different music types were useful in different cases of ASD. The simple music was correlated with increased responses to joint attention among children with severe ASD, whereas children with mild or moderate ASD responded better to complex music. Kalas's findings are important insofar as they constitute an empirical case for the positive impact of music

therapy on the attention of ASD children, and insofar as they suggest that different types of music should be applied to ASD children depending on their position in the spectrum.

A study carried out by LaGasse (2014) confirmed Kalas's (2012) findings. LaGasse was interested in the effect of music therapy on several communication markers among ASD children. LaGasse measured the relationship between exposure to music therapy and the outcomes of attention, ability to initiate communication, responses to communication stimuli, and social behaviors. LaGasse found that exposure to music therapy was positively and significantly associated with attention increases in ASD children. However, based on LaGasse's data analysis, none of the other markets of communication difficulties were ameliorated by exposure to music therapy.

In another study music therapy was administered as part of a family setting, in which young children with ASD diagnoses were asked to engage in music therapy alongside their parents (Thompson et al., 2014). In this setting, social communication skill was the dependent variable. Thompson et al. found a positive effect of music therapy on social communication skills among young people with ASD diagnoses, but there were important limitations in the study. First, the rating system was not blind, so, as in Boso et al.'s 2007 study, there was the potential for raters to issue biased ratings. Second, while the experiment included a control group, it did not contain distinct music therapy-only and family therapy-only groups, so it was impossible to reach a conclusion about the extent to which the positive results of the study were due to music therapy, the participation of the family, or the interaction between music therapy and the participation of the family.

Ettlinger et al. (2011) and Pasiali (2012) and noted the differences in the parent-child relationships and social and emotional development of the autistic child. Factors that contributed to the social and emotional development of the autistic child include encouraging communication. This might manifest itself in a child enjoying family group activities. Some of the benefits seen after music therapy include mutual parental/child enjoyment, which is critical for familial bonding, the establishment of routine family systems, and a confident, yet relaxed demeanor of the parent, which has been shown to enhance communication skills (Ingram, 2009).

Geretsegger, Elefant, Mössler, and Gold (2014) drew upon the results of statistical meta-analysis to estimate the effects of music therapy on social communication among individuals with ASD. Statistical meta-analysis has been described as being more reliable than the results of individual empirical studies, as statistical meta-analyses pool the results of studies and thereby achieves a more accurate estimate of effect sizes and statistical significance than individual studies can achieve (Schmid et al., 2014; Wouters, Van Nimwegen, Van Oostendorp, & Van Der Spek, 2013).

Geretsegger et al. (2014) drew upon the results of numerous RCTs. RCTs are considered to possess the highest level of value for inclusion in meta-analysts, because RCTs include random assignment to control groups, which is the hallmark of a good experiment (Borenstein et al., 2009; Cooper et al., 2009; Glass, 1976; Lipsey & Wilson, 2001; Schmid et al., 2014; Wouters et al., 2013). However, even though Geretsegger et al. (2014) drew upon RCTs, Geretsegger et al.'s (2014) discussion of several of these RCTs indicated that blind ratings were not utilized. Thus, even though assignment to

music therapy versus control groups was blind, the raters who attempted to measure changes in communication skills were aware of which individuals were in which group, giving rise to the same possibility of bias that occurred in Boso et al.'s (2007) and Thompson et al.'s (2013) empirical studies.

Because Geretsegger et al. (2014) were able to pool the results of multiple studies that measured different types of communication, they were able to identify what appeared to be a systematic advantage of music therapy over placebo interventions or control conditions. Specifically, Geretsegger et al. found that music therapy was superior to control conditions for the dependent variables of (a) social interaction within therapy, (b) general social interaction outside therapy, (c) non-verbal communication within therapy, (d) verbal communication, (e) behavioral imitation, (f) social and emotional reciprocity, (g) social adaptation, and (h) parent-child relationships. However, Geretsegger et al. found no statistically significant effect of music therapy on non-verbal communication skills outside the therapeutic setting. Cumulatively, these findings suggest a near-global effect of music therapy on a wide variety of communication skills among ASD-diagnosed individuals.

Gattino, Riesgo, Longo, Leite, and Faccini (2011) studied the effects of music therapy on communication among individuals with ASD did utilized blind ratings. In Gattino et al.'s experiment, which took place in Brazil, 12 boys with an ASD diagnosis were randomly assigned to a musical therapy group, whereas another 12 boys with an ASD diagnosis were randomly assigned to a control group. The dependent variable of the study was measured using the Childhood Autism Rating Scale (CARS), which contains

measures of verbal and non-verbal communication. Gattino et al. found that there was a significant effect of music therapy on non-verbal communication, with the effect size measured as 2.22. In other words, the boys in the music therapy group experienced an improvement in non-verbal communication that was 2.22 times greater than the change in non-verbal communication among boys in the control group. As Gattino et al.'s findings were based on blind rating, their results should be considered more valid and reliable than those obtained in studies (Boso et al., 2007; Thompson et al., 2014) that lacked blind ratings. Interestingly, Gattino et al. (2011) did not find the near-global improvement in communication identified in Geretsegger et al.'s (2014) statistical meta-analysis, which supports the inference that non-blind rater bias could be responsible for the extent of communication improved measured in other studies.

While ratings are an important means of measuring changes in social communication capacity in response to an intervention such as music therapy, other measures of change are possible as well. Kim et al., 2008 studied the application of music therapy to children with ASD diagnoses; the dependent variables included measures of (a) the length of eye contact and (b) the frequency of turn-taking among RCT participants. Kim et al. found that participation in the music therapy group was associated with significantly longer eye contact and significantly more turn-taking during conversations. Because eye contact and turn-taking are both foundational components of communication skill, and because these two components are more amenable to direct measurement, Kim et al.'s study made an important contribution to the research base on music therapy among ASD-diagnosed individuals. If music therapy can improve eye

contact and turn-taking among ASD-diagnosed individuals, it follows that such individuals can achieve improvements in both verbal and non-verbal communication as a result of participation in music therapy.

Finnigan and Starr (2010) carried out a study designed to gauge the impact of music therapy on social responsiveness. This study had a sample size of one, which was a major limitation in terms of generalizability and statistical power. However, Finnigan and Starr measured outcomes over the course of 12 treatment sessions, resulting in greater analytical power. They found that music therapy promoted greater social engagement behaviors from the autistic child. As engagement behavior is an important component of both verbal and non-verbal communication, Finnigan and Starr's findings suggest that music therapy should improve the overall communication capacities of autistic children.

One seemingly unique study explored the hypothesis that music therapy could improve communication in ASD children through the mechanism of *synchrony* (Venuti et al., 2017). "Synchrony is characterized by a continuous dynamic and reciprocal adaptation of the temporal structures of behavior and emotion that are shared between interactive partners" (Delaherche et al., 2012, p. 355). The authors explained that, "A severe lack of synchrony is indeed a core issue within the communication and interaction deficit that characterizes" (Venuti et al., 2017, p. 162). Thus, hypothetically, one of the mechanisms through which music therapy might improve communication in ASD children was through improvements in synchrony.

Venuti et al. (2017) utilized a one-sample approach to measuring changes in synchronic activity among a sample of 25 children diagnosed with ASD. These children

were young in age, ranging from 4 to 6. The children interacted with their mothers, were exposed to improvisational music therapy, and were asked to interact with their mothers again. The main finding was that, in fact, synchrony increased in ASD children after exposure to music therapy. Based on this finding, Venuti et al. suggests that one of the mechanisms through which music therapy improved communication among ASD children was through increases in synchrony. It does not appear as if scholars other than Venuti et al. have examined the link between music therapy and synchrony improvements in children with ASD.

Implications

Autistic children do not grow up in isolation. They must be helped to tolerate and engage in the world around them. It is that the concept of inclusive classrooms must be the standard of care for this population whenever possible. When an autistic child is placed in an inclusive classroom setting, it is imperative that the teacher be familiar with all the therapy opportunities available to facilitate maximum educational progress. While most educators are familiar with speech and language, occupational and physical therapies, modalities involving the arts are often overlooked or dismissed as a waste of valuable instructional time. It is up to the teachers of children with disabilities to educate themselves and utilize whatever treatment modality necessary to bring about positive and lasting educational progress.

The information gained from this study may benefit administrators and educators in ascertaining the effectiveness of a music therapy approach to improve the communicative skills for children with autism. The findings of this study were used to

develop a project, in the form of a professional development program which can be found in Appendix A.. If implemented, administrators and educators in district could enhance their understanding of different approaches in improving communication skills with ASD children.

Summary

The importance of measuring and developing receptive and expressive communication skills in children with ASD is correlated with the importance of being able to effectively communicate in a social context (Crane, 2015). Those skills include being able to determine who is speaking, being able to follow the speech of the person communicating, being able to find who is speaking, being able to speak in appropriate language patterns, and being able to speak fluidly and at an appropriate pace (Crane, 2015). Improvisation within the application of music therapy intervention programs is also vital, since it allows nonverbal ASD children an avenue to communicate via gestures (Crane, 2015).

Music can be a powerful area of potential growth for students on the autism spectrum. Songs and instrumental activities can help promulgate speech and vocal imitation skills. They have been to improve ASD children's attention span and have been seen to lead to better self-expression. The effectiveness of various forms of musical interventions show positive effects in improving communication, social interaction, and emotional engagement among ASD individuals (Slimpoor et al., 2011). Music therapy assists many individuals to have a positive effect on the rate of communication skills. With those on the spectrum, it has been shown to aid in the use of receptive and

expressive language skills (Gambino, 2014). Delayed receptive and expressive language ability has been noted to negatively impact the development of relationships with peers and adults, and functional language (Geist & Geist, 2012).

First, it was established that there is a scholarly consensus is that there is no satisfactory neuroscientific theory of how or why music therapy works (Raglio et al., 2012; Raglio et al., 2016; Ueda et al., 2013). Second, it was established that there is a sufficient base of empirical evidence (Accordino et al., 2007; Finnigan & Starr, 2010; Gattino et al., 2011; Geretsegger et al., 2014; Kim et al., 2008, 2009; Raglio et al., 2012; Raglio et al., 2016; Thompson et al., 2014; Ueda et al., 2013) suggesting a positive impact of music therapy on individuals with ASD. Numerous mechanisms have been proposed to explain these empirical findings. Such mechanisms tend to focus on issues related to emotional modulation, but further studies are required to better understand the existence and characteristics of these mechanisms. Third, numerous limitations in the empirical research base were conducted, including limitations related to the failure to control for the use of ALDs and other variables. These limitations in the empirical literature appear to justify the study design and methodology proposed and defended in Section 2.

Section 2: The Methodology

Research Design and Approach

I used a quantitative single-subject A-B research design to measure the efficacy of a music therapy program for autistic children at the local research site regarding their social-communication skills. Researchers use the single-subject A-B research design when they want to evaluate behavioral outcomes in individuals (Byiers, Reichle, & Symons, 2012). The A-phase, or baseline phase, includes measurements taken to establish a baseline, and the B-phase, or intervention phase, includes measurements taken during the intervention (Byiers et al., 2012).

My main objective was to determine the effect of music therapy on the social-communication skills of autistic children. The single-subject design was appropriate, as this type of design is effective in evaluating an individual's change in behavior after exposure to an intervention (Smith, 2013), and is commonly used in behavioral and educational research. The single-subject AB design is more appropriate than single-subject designs involving multiple baselines or a withdrawal phase, as the former requires that participants not interact with each other and the later requires the withdrawal of the intervention (Byiers et al., 2012). The current research design involved a single classroom of autistic children, and as such it would have been unethical to separate them to provide the statistical control required by the multiple baselines approach. In the same manner, it would be unethical to withdraw the music therapy program if it appears to be effective; additionally, withdrawing the music therapy program may not account for any learning that takes place through the music therapy program.

Setting and Sample

The schools serving as the research sites for the study were located in a small suburban town in central New Jersey. Enrollment figures for autistic children in the district have increased over the past 4 years. Of the 1,393 students classified as special education students for the 2016-2017 school year, 135 of those were diagnosed with autism. This is a 44% increase from the 2013-2014 school year, when the district enrolled 76 autistic children. From 2014-2018, the number of autistic children enrolled in the district continued to increase. It is reasonable to expect the enrollment of autistic children will continue to increase.

The district has 12 elementary schools in which there are eight self-contained classes of autistic children, five applied behavior analysis classes, and 15 learning language disabled classes. There are 28 elementary special education teachers of which eight teach students who are classified as autistic.

The director of special services implemented a music therapy program in a district building where I am not the principal. One of the two autistic classes received a treatment of music. This class has six students who received the district-mandated treatment. Because statistical analyses were not used, traditional power analyses were not used. According to the What Works Clearinghouse (WWC; Hansen, Blakely, Dolata, Raulston, & Machalicek, 2014), standards for single-subject designs require at least five datapoints (i.e., individuals from whom to collect data). As such, a classroom of six individuals satisfied that requirement.

Instrumentation and Materials

The Assessment of Social Skills for Children with Autism (ASSCM) was copyrighted and published in *Do-Watch-Listen-Say: Social and Communication Intervention for Children with Autism* by K. A. Quill (2000). This instrument is an observational rating form for communication skills and was designed for practitioners and researchers to assess the communicative competence of ASD individuals. I received permission from the instrument's developer to use the instrument.

I used the ASSCM to assess social skills competencies of the children. The ASSCM is focused on receptive and expressive language. Example items include "child can name the objects" and "can use three words at a time." Teachers responded to 30 items with *never*, *sometimes,* or *always*, and each response was summed to create a total score. Responses of *never* received a score of 1, responses of *sometimes* receive a score of 2, and responses of *always* receive a score of 3, for a total maximum score of 90. Higher scores indicated higher communication skills. This instrument is valid and reliable because it was developed by expert(s) in the field of autism, and it was published. However, because this tool is only a checklist of the frequency of common behaviors and not a psychometric instrument attempting to capture or represent theoretical constructs, there are not traditional measures of validity and reliability associated with this tool, such as construct validity or internal consistency.

Music Therapy Intervention

To better understand what the special education teachers looked for and reported on, the following describes the music therapy intervention that occurred. A music teacher

conducted nine weekly music therapy sessions as per the directive of the director of special services. These music therapy sessions occurred during the students' normal music instruction. For 3 weeks prior to the implementation and during the 9-week implementation, the special education teachers noted each behavior on the ASSCM.

In the music therapy , musical instruments were available, including a full-size guitar, a small children's play guitar, maracas, jingle bells, hand drums, wood blocks, and tambourines. The music teacher used a CD player to play a *Tuned in to Learning* CD with specific prerecorded songs for the music therapy sessions, a full list of which is in Appendix D. This CD includes songs designed by an autism specialist and music therapist. The intervention consisted of a variety of songs, movement activities, and instrumental activities to target specific skills (see Appendix E for a sample lesson plan). The lessons included the same opening and closing songs each week.

Each music therapy session began with an introductory song from the CD, entitled *Getting to Know Someone*. Students tapped their legs utilizing tambourines while at the same time singing the melody. Each child was given an opportunity to pluck the guitar while his or her name was sung. The objectives for this melody was the introduction to the music treatment gathering, peer mindfulness, and name acknowledgment.

After the introductory song, students participated in a movement activity. An example is the song *You Gotta Sing When Your Spirit Says Sing*. This is a movement-oriented song in which students held hands and performed different movements in a

circle as directed by the music teacher, such as parading, swinging arms, or skipping. This focused on peer awareness and skill building.

After movement activities, students chose instruments and participated in a guided instrumental activity. For example, a song entitled *Pass It Along* gave students a chance to practice sharing musical instruments with other students. Another song, *Can You Find a Friend?* expected students to discover a companion who had the melodic instrument named in the tune and request that they share their instrument. This activity builds skills such as asking questions and eye contact.

Students engaged in several other suggested songs, such as *Rules of Conversation*, *Expression on my Face*, and *Look Over Here,* which the music teacher used to increase students' use of expressive language. Finally, a goodbye song, *It's Your Solo*, closed out each session. All students clapped their hands to the sound as the music teacher called one student at a time to take a dance or rhythmic solo and share what they learned in that session. The music teacher provided visual prompts to assist students in remembering.

Data Collection and Analysis

The students received music therapy as part of their weekly music lessons delivered by the music teacher. At the beginning of the 9-week intervention, the special education teacher of the students assessed the students using the ASSCM to establish a baseline measure of behavior (pretest; Byiers et al., 2012). The assessment allowed the educator to gather specific information about the learner, set goals based on the information, and monitor the development of each individual. During the 9 weeks of music therapy, the special education teachers used the instrument to assess behaviors at

least three times in order to satisfy WWC single-subject design standards (Hansen et al., 2014.) At the conclusion of the 9 weeks of music therapy, the special education teachers once again used the instrument, this time as a posttest. For a timeline of the music therapy intervention, see Appendix C.

The special education teachers deidentified the results and submitted them to the director of special services, who shared them with me. The director of special services had mandated the use of music therapy for the group of students. The data I received from him, as well as the results of the study, were stored in a locked file cabinet in my office and will be there for 3 years

Data Analysis Plan

I collected data representing the number of communication skill behaviors the teachers' observed. I entered the data into IBM's Statistical Package for the Social Sciences (SPSS) v. 25 program for data management and analysis. I computed a total communication score for each student at each time point.

I assessed the data through visual analysis of graphs of the communication scores for each student. Visual analysis of graphs of behavioral data is the most common method used to assess data collected within single-subject AB research designs (Lane & Gast, 2014). Each student's total communication scores were plotted onto line graphs. These line graphs included data for the baseline and intervention phases. I followed the four steps for visual analysis of graphs proposed by Kratochwill et al. (2013). First, I documented a stable baseline pattern (e.g., if a student has a consistent communication score). I established the baseline measure, then examined the data within each phase (e.g.,

baseline and intervention, in this case). Next, I compared the data between each phase (i.e., baseline and intervention) to assess whether the intervention could be tied to an increase or decrease in responding (e.g., a noticeable change in communication scores). Finally, the fourth step of Kratochwill et al.'s (2013) procedure was to integrate the results of each step to establish whether there were at least three demonstrations of an effect of the intervention at different points in time. After this visual analysis, I determined the effect size of the change in communication skills using the Percentage of Data Points Exceeding the Median (PEM) effect size calculation (Lenz, 2012). Combining this measure of effect size with the visual analysis allowed for greater confidence in the results of this research (see Vannest & Ninci, 2015). The PEM calculation can provide a good indication of the effectiveness of an intervention (Scruggs & Mastropieri, 2013). The PEM effect size analysis is more appropriate for the small sample size in this research and is less sensitive to possible outliers (Lenz, 2012). I calculated the PEM by determining the median for the communication score during the baseline phase and then determining the proportion of data points in the intervention phase that were greater than this median value (Lenz, 2012). This value was multiplied by 100 to determine the percentage of datapoints that exceed the median value.

Threats to Validity

Internal validity can be a concern with a nonexperimental design, such as the single-subject AB design, as experimental control is not established (Byier, 2012). Consistent with expert recommendations, I considered any results as correlational rather than causal (Byier, 2012). Additional concerns for internal validity included whether

there are characteristic differences between the students in relation to degrees of parent intervention and involvement in music therapy outside of the classroom. Furthermore, if parent intervention is or has been occurring amongst the students, it is not known what types of music therapy the students have already been exposed to. Additional unknowns included (a) whether the intervention methods utilized in the study overlapped with, duplicated, or undermined any intervention done on the part of the parents and (b) whether there was a way to accurately identify the occurrence of parent intervention prior to the attainment of each group's pretest scores.

Although it would have been ideal to be able to identify which students are involved in parent intervention methods outside of school, this would require a few steps. First, it would have required the district to solicit the parents for information regarding any outside intervention methods used with the children outside the classroom. Second, the district would have needed to identify the fact that outside intervention therapy was occurring within each student records. Third, it would have required parents to be trained and knowledgeable in said intervention methods and be forthcoming in their disclosures. Given the complexity of the above, I am accepting the limitation of not factoring in any outside therapy intervention amongst the students. Additionally, because each individual served as their own control in single-subject designs, the risk of biased results due to parent intervention is mediated, as each student was compared against their own baseline rather than against each other.

Assumptions, Limitations, Scope, and Delimitations.

I assumed that the responses from the special education teachers who completed the observational ratings were honest. I assumed this because I assured them that this is not a measure of their performance and would not affect their position.

A limitation of this study was the small sample size. This is unavoidable, as the program I evaluated only exists in one school. Researchers would need to replicate the study with a larger number of teachers to add validity to these results. However, single-subject research designs are specialized for small samples. The second limitation is that I conducted this study over a period of only 9 weeks. This may not have been enough time to see significant gains in areas such as students' eye gaze and joint attention. Additionally, because I was not personally assessing the students; I depended on the teacher's checklist of observed behaviors for each student. While the teacher's reporting can be assumed to be accurate, there may be inconsistencies in reporting if a teacher becomes momentarily distracted.

I only examined the teachers' observations of their students' behaviors in the classroom. I did not look at the students' in any other setting, or any other characteristics of the teachers. I delimited this study to one school district, as that is where the music therapy program was conducted.

Protection of Participants' Rights

All information came from secondary district deidentified data. The teachers provided the students' results of the ASSCM to the director of special services, who deidentified them and forwarded them to me. The chances of bias and coercion were

reduced, because I was only be in contact with the district director of special services. The music therapy intervention would have occurred regardless of this research study. A general concern regarding quasi-experimental studies is the withholding of an intervention from the other classrooms. Based on the results presented in this final report, the director of special services will determine if the initiative should be mandated for all children in self-contained classes for the autistic.

Data Analysis Results

I collected data on a total of 6 students. Five out of 6 in the music therapy treatment group were male and one was female.

Communication scores for these students could range from 30.00 to 90.00. On average, the students scored a communication score of 32.42 (*SD* = 2.27) at the pretest, a communication score of 37.42 (*SD* = 6.64) on the midtest, and a post communication score of 50.33 (*SD* = 20.02). Table 1 presents summary statistics for these scores. In the following sections, the communication scores of each of the six student will be presented using line plots. In keeping with the single-subject A-B research design, I evaluate each student's communication scores using descriptive text as well as through the provision of a figure. Each participant is described in the following sections.

Table 1

Summary Statistics Table Communication Scores at Pre-, Mid-, and Posttest

Variable	Min	Max	*M*	*SD*
Precommunication score	30.00	35.00	32.42	2.27
Midcommunication score	37.42	47.00	37.42	6.64
Midcommunication score 2	30.00	60.00	41.58	11.50
Midcommunication score 3	30.00	73.00	45.75	16.08
Postcommunication score	30.00	76.00	50.33	20.02

Participant 1

Participant 1 was female student. At the pretest, she had a communication score of 30.00. At the midtest, her communication score improved to 43.00. Her scores continued to increase at the second and third midtests. At the posttest, her score improved again, to 67.00 points, for a total improvement of 37.00 points. Figure 1 presents a line plot of this student's scores.

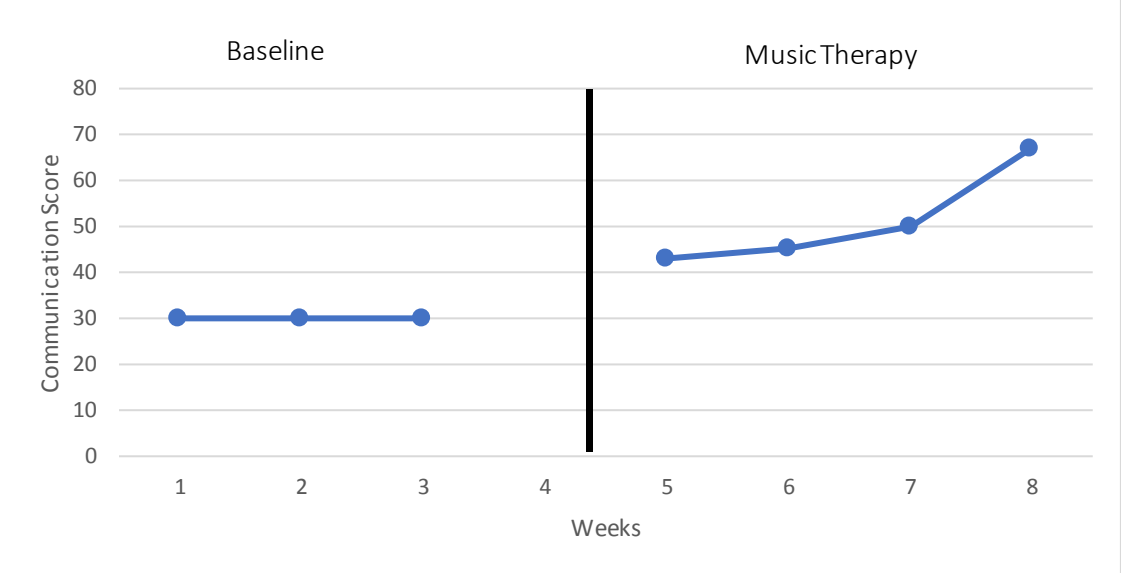


Figure 1. Line plot of communication scores for Participant 1.

Participant 2

Participant 2 was male student. At the pretest, he had a communication score of 34.00. At the midtest, his communication score improved to 40.00. His scores continued to increase at the second and third midtests. At the posttest, his score improved again, to 67.00 points, for a total improvement of 33.00 points. Figure 2 presents a line plot of this student's scores.

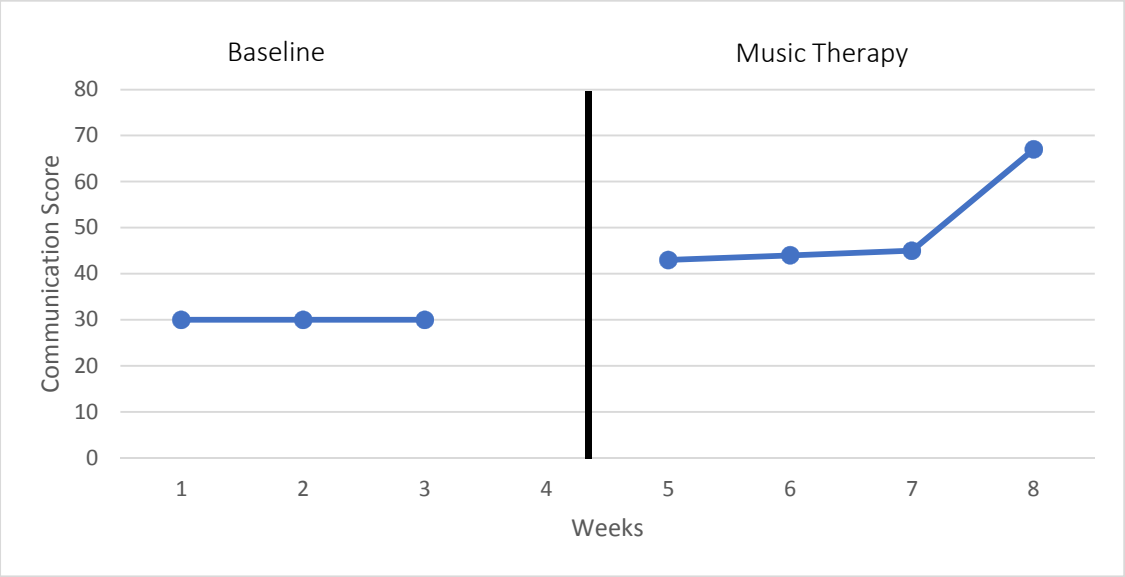


Figure 2. Line plot of communication scores for Participant 2.

Participant 3

Participant 3 was male student. At the pretest, he had a communication score of 35.00. At the midtest, his communication score improved to 46.00. His scores continued to increase at the second and third midtests. At the posttest, his score improved again, to

62.00 points, for a total improvement of 27.00 points. Figure 3 presents a line plot of this student's scores.

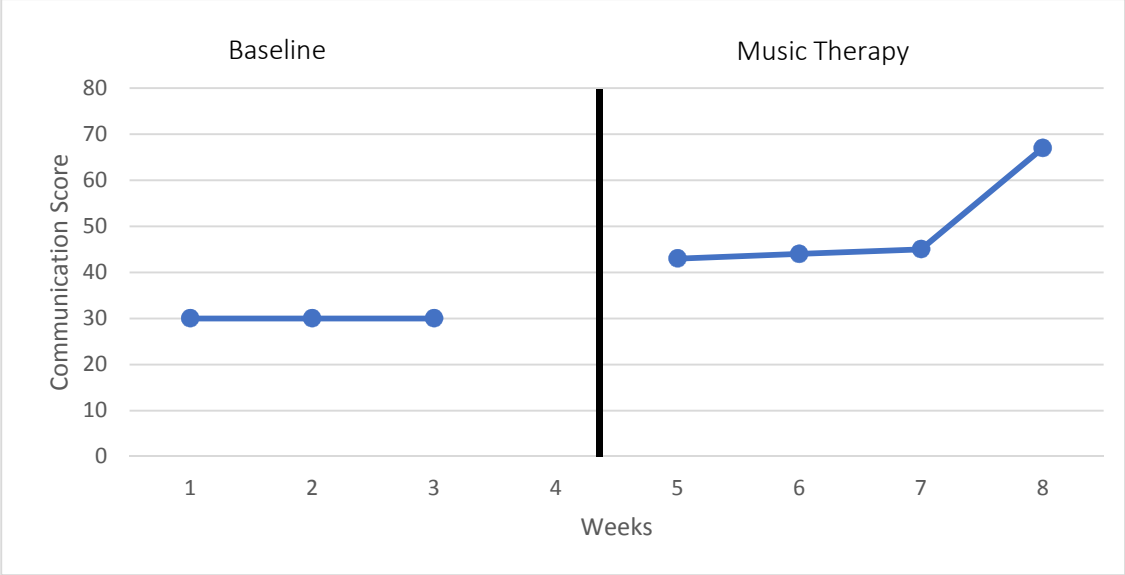


Figure 3. Line plot of communication scores for Participant 3.

Participant 4

Participant 4 was male student. At the pretest, he had a communication score of 35.00. At the midtest, his communication score improved to 44.00. His scores continued to increase upon following tests. At the posttest, his score improved again, to 69.00 points, for a total improvement of 34.00 points. Figure 4 presents a line plot of this student's scores.

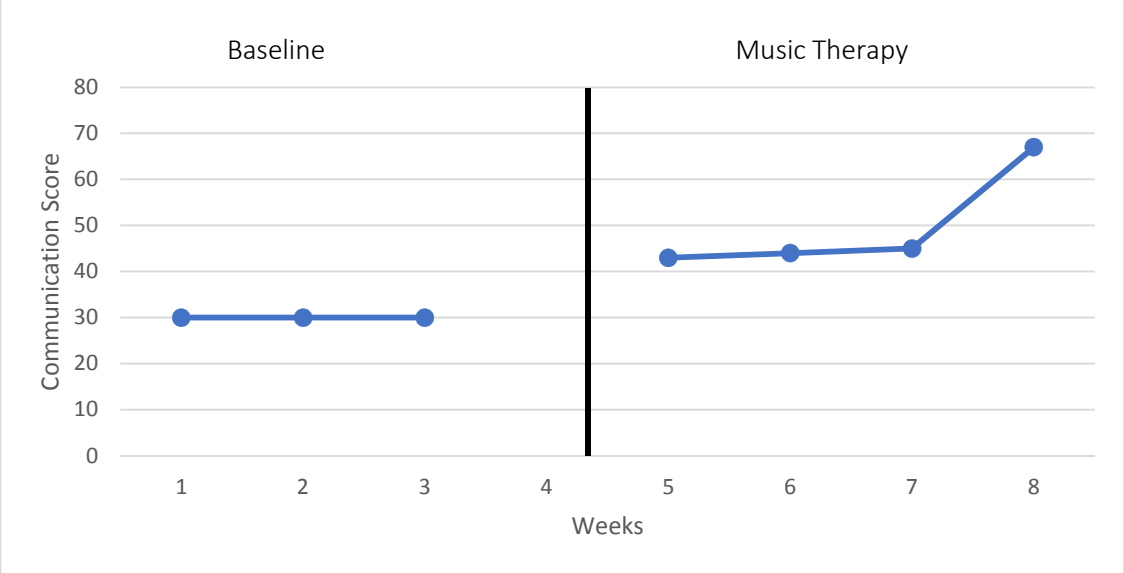


Figure 4. Line plot of communication scores for Participant 4.

Participant 5

Participant 5 was male student. At the pretest, he had a communication score of 31.00. At the midtest, his communication score improved to 47.00 points. His scores continued to improve in subsequent tests. At the posttest, his score improved to 76.00 points, for a total improvement of 45.00 points. This participant showed the largest improvement overall. Figure 5 presents a line plot of this student's scores.

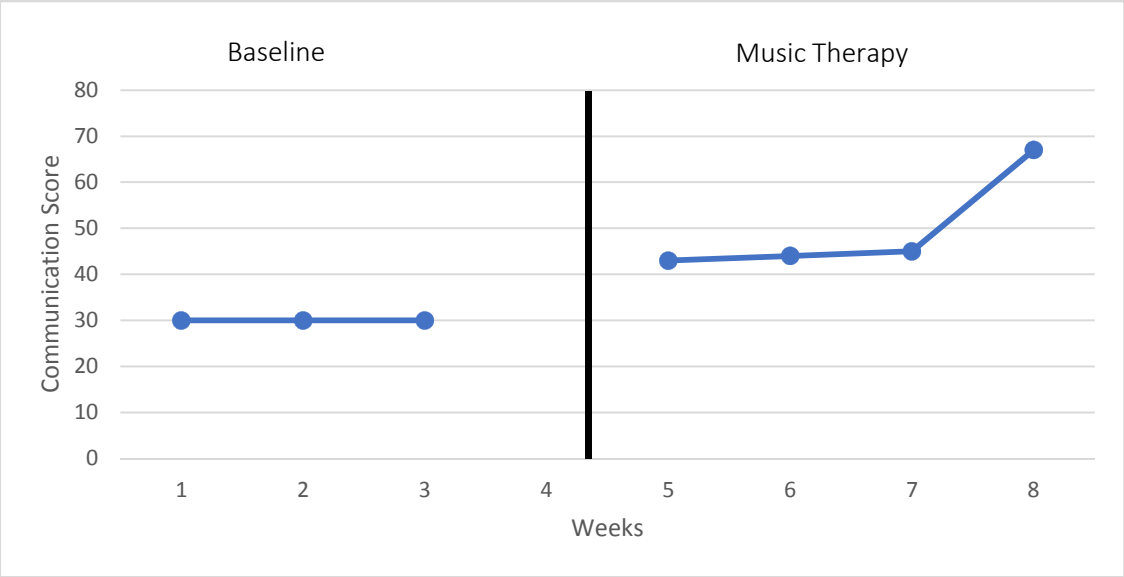


Figure 5. Line plot of communication scores for Participant 5.

Participant 6

Participant 6 was male student. At the pretest, he had a communication score of 35.00. At the midtest, his communication score improved to 40.00. This student's scores also increased at the second and third midway tests. At the posttest, his score improved again, to 74.00 points, for a total improvement of 39.00 points. Figure 6 presents a line plot of this student's scores.

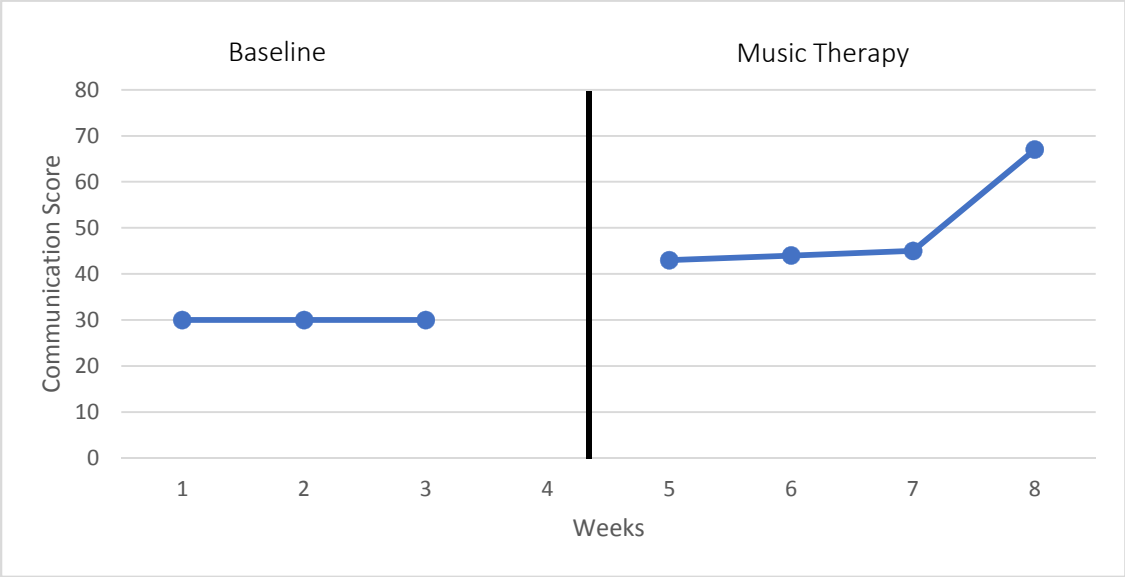


Figure 6. Line plot of communication scores for Participant 6.

Overall findings

These findings indicate that there could be a benefit to providing students with ASD with a music therapy class regarding appropriate communication behaviors. As a treatment modality for ASD, music therapy provides a unique variety of musical experiences in an intentional and developmentally appropriate manner to effect changes in behavior and facilitate development of skills. As such, I created a professional development program (Appendix A) aimed at educating teachers and administrators regarding the benefits of music therapy towards students with ASD. This professional development program will consist of at least 3-days of training for both teachers and administrators.

Overall, this professional development program was created to educate teachers and administrators about music therapy. Additionally, this professional development program will hopefully (a) facilitate dialogue between administrators and teachers, (b)

disseminate research and history on music therapy and its long term effects, (c) provide information on administrative issues involved in providing subsequent professional development and resources for teachers of students with ASD, (d) open up potential lines of communication between administrators, supervisors, teachers, and parents about ASD and which kinds of therapy are most effective, and (e) introduce administrators to the structure of an online digital meeting and an online professional learning community (PLC) in order to more effectively introduce new knowledge to their own schools.

This professional development program would be beneficial to the educational growth of teachers and administrators. Frequently, administrators and teachers are inundated with demands to carry out new instructions to improve student achievement. Rather than focusing on student achievement, this professional development program focuses on a way for administrators and teachers to collaborate on the provision of more potentially life-improving therapies for students with ASD.

In the following section, Section 3, I will provide a more detailed description of this project. I will present a review of the literature relating to the genre of professional development, as well as provide a scholarly rationale for the present professional development project. Next, I will discuss the project evaluation plan. Finally, I will provide the possible social implications for this project, as well as the importance of this project to local stakeholders and the larger educational community.

Section 3: The Project

Introduction

This project involved developing professional development and curricular materials to administrators interested in advancing music therapy interventions focused on improving social and communication skills among children with ASD. Along with Bronfenbrenner's ecological framework, the theory of mind and theory of multiple intelligences informed the designs of professional development materials for administrators to help educators' foster improvements in relationships with school administrators as well as with teachers. Accordingly, the purpose of this project was to identify which professional development materials produce empirical, evidence-based improvements to relationships between educators of children with ASD and school administrators.

In the following section, I explain a professional development project for creating a 3-day inservice to provide guidance and assistance to administrators and teachers interested in improving leadership skills and teacher capacity, which are linked to the increase of communication skills with ASD children. Inservice training that is ongoing in nature and that offers opportunities for self-reflection are often valued more by participants when tailored to individual needs (Whitebook, Gomby, Bellm, Sakai, & Kipnis, 2009). In subsequent sections I identify and describe the goals of the project, review of literature, description of the project, discussion of the project evaluation plan, and project implications.

Description and Goals

The 3-day professional development will provide administrators and teachers of the school district with knowledge and tools to develop skills and build strategies to incorporate music intervention into daily class instruction to increase social communication with ASD children. This research-based approach will identify strategies to support the district to implement music intervention with ASD children to support administrator and teacher best practices. The goals of the project are:

1. Build relationships among special education teachers and general education teachers to increase awareness of potential therapies to help assist students with ASD in the general education and special education setting.
2. Disseminate research and history on music therapy and its long-term effects.
3. Provide information on what it might be like administratively to provide the needed professional development to assist teachers with appropriate resources for students with ASD.
4. Build a continuum between administrators, supervisors, teachers and parents about the disability and which kinds of therapy are most effective.

The term "professional development" was defined by the National Staff Development Council to mean "a comprehensive, sustained, and intensive approach to improving teachers and principals' effectiveness in raising student achievement, and may be supported by activities such as courses, workshops, institutes, networks, and conferences" (Wei et al., 2009, p. 4). This research-based approach will emphasize a collaborative culture that focuses on the learning of all members in a school community.

This study was supported by the quantitative data collected and analyzed in Section 2, which indicated using music therapy with ASD children increased their social-communicative skills.

Rationale

The rationale for conducting an intervention that involves designing professional development and training curriculum materials reflects the data analysis considerations described in Section 2 of this proposal. Using the ASSCM, this project involved establishing baseline behavioral measures at pretest that allow educators of children with ASD to collect specific data about each learning. Designing professional development and training curriculum materials also involves educators of children with ASD monitoring empirical data collected from each student participating in music therapy interventions over a 9-week period.

Concerning the relationship between the research problem and the project content, the rationale for conducting this project pointed to the satisfaction of single-subject design standards developed by the What Works Clearinghouse (Hansen et al., 2014). When the 9-week music therapy intervention ended, the teacher conducted a posttest assessment to highlight differences in empirical outcomes indicating improvements to social and communication skills among children with ASD. The relationship between the problem and project content is suggestive of how researchers identified individual- and group-level differences in social and communication skills improvements after 9 weeks. However, this project entailed the analysis of secondary data obtained from the director

of special services at the local school district located in New Jersey, who mandated the use of music therapy to improve social and communication skills in children with ASD.

As described in Section 2, the data collection and analysis procedures employed in this project involved the use of IBM's Statistical Package for the Social Sciences (SPSS) version 25 program to compute individual and aggregate differences pertaining to social and communication skills improvement among children with ASD. The data collection and analysis procedures also included visual and graphic presentations of differences in behavioral outcomes produced by direct participation in the 9-week music therapy intervention. Accordingly, this project included data from empirical measurements of baseline (pretest) and outcome (posttest) results. Any noticeable improvements to social and communication skills received critical attention to the extent that school administrators may use more informed decision-making processes to enhance the professional development behaviors among educators of children with ASD. Moreover, the data collection and analysis procedures selected for this project indicated that all professional development materials should emphasize the correlation between social and communication skills. As suggested by the following review of the extant scholarly literature, the short- and long-term impacts of professional development among educators of children with ASD depend mostly on which theoretical and conceptual frameworks help foster improvements to social and communication skills.

Review of the Literature

The literature selected for this section of the project draws from efforts to include specific and relevant search terms. Each of the literature search terms was relevant for

demonstrating saturation as well as illustrating the relationship between theory and practice. Search terms identified for the purpose of conducting a thorough literature included *music therapy, music education, autism, autism spectrum disorder, children, elementary school, primary school., professional development, curriculum design, curriculum development, social skills, communication skills, cognitive development,* and *pedagogical interventions.* All of the information described in this review of the extant literature is available in scholarly, peer-reviewed, academic journal publications and has specific relevance to the study problem concerning the relationship between music therapy and social/communication skills improvement in children with ASD. As described below, the themes addressed in this review of the literature emphasize key differences in theoretical and conceptual frameworks, the pedagogical significance of professional development and training programs in relation to the evidence-based outcomes of music therapy interventions, and the empirical impacts of professional development and training programs.

Theoretical and Conceptual Frameworks

The theory of mind (ToM) lens informed this review of the literature describing how enhancements to professional development significantly improve relationships between school administrators and educators of children with ASD. ToM emphasizes the relationship between social interactions and behaviors while it also draws particular attention to deficits in social and communication skills (Mpella & Evaggelinou, 2018). The ToM lens applies mainly to improving the social and communication skills such as the development of comprehensive professional development materials enhances

cognition development and emotional expression in children with ASD. ToM is significant for explaining why children with ASD are not successful at emulating the behaviors of individuals without the developmental disorder (Kuo, Lin, Kuo, Kuang, & Dai, 2016). The major implications of this research strand are that any professional development materials designed to improve relationships between school administrators and educators of children with ASD must reflect key differences between a wide variety of personal interests. Both school administrators and educators of children with ASD must consider how individualized learning plans also have valuable implications for achieving positive results for an entire group of students (Hourigan, 2016, p. 69). However, the professional development materials may only reinforce problems caused by an overemphasis on reducing deficits in social and communication skills.

In concert with the ToM framework, the theory of multiple intelligences provided a foundation for educators of children with ASD to work with school administrators in designing professional development materials. Lloyd (2017) drew from the theory of multiple intelligences to argue that most schools emphasize only math and literacy skills as required by standardized tests administered at the state and federal levels. This strand of the research literature illustrates how school administrators may not understand the underlying causes of why children with ASD may exhibit a lack of interpersonal, intrapersonal, musical, and bodily-kinesthetic intelligences. By identifying these deficits, educators of children with ASD and school administrators interested in designing effective professional development materials must act as advocates for multiple forms of expression. Applying the theory of multiple intelligences has further significance for

improving professional relationships between educators of children with ASD and school administrators by which the former may integrate various forms of learning to promote aesthetic awareness and reduce the negative impacts of any known cognitive deficits.

Professional Development for Teachers

Professional development opportunities are a big part of the educational growth of administrators and teachers and are a way for educators to improve in teaching practices in education to increase student achievement for all students. There are many demands for educators to carry out new instructional interventions to improve student achievement (Guskey, 2010). For professional development to have an impact it needs time for teachers to be organized and structured in their instruction focused on both content pedagogy, and organized in their planning (Birman, Desimone, Porter, & Garet, 2000; Guskey, 1999). Professional development is critical to expanding teachers' knowledge of instruction to increase students' achievement who are mainstreamed in their classroom (Jenkins & Yoshimura, 2010).

Similarly, nursing researchers applied neuroendocrine theory, resonance theory, and the energy spectrum of music wave theory to describe the underlying mechanisms of how professional development should emphasize how music therapy interventions improve cognitive functioning and promote emotional expression in children with ASD. For example, Shi, Lin, and Xie (2016) noted how acoustic waves act on the limbic system in the brain and, in turn, excite nerve cells located in the brain stem. The complex neuro-limbic relationship between the music and brain functioning suggests that exposure to effective professional development and training programs designed by educators of

children with ASD and school administrators must focus on improving social and communication skills as well as enhancing individual- and group-level participation.

In concurrence, Salvador (2015) drew from music learning theory (MLT) to describe how educators may institute music therapy interventions to improve social and communication skills. This strand of the research literature is significant for designing effective professional development and training programs such that educators of children with ASD and school administrators may draw from MLT to improve collaborative relationships. Educators may also encourage school administrators to recognize how improvisation may allow students with ASD to develop knowledge and skills that align with the theory of multiple intelligences (Lloyd, 2017; Salvador, 2015). However, Salvador (2015) suggested further that professional development and training programs may improve professional relationships between school administrators and educators of children with varying degrees of ASD. Most music therapy interventions, instead, intend to improve cognitive functioning and logical intelligence in children unable to discern musical pitches or maintain a steady rhythm when following along with songs. In terms of professional development, the emphasis placed on these improvements has short- and long-term significance for bridging gaps in knowledge between educators and school administrators.

More interestingly, researchers who drew from a learning theory-based approach argued educators should emphasize the relationship between improvements to thoughts and behaviors in children with ASD when communicating results of empirical studies to school administrators. Cooney and Menezes (2018) found that educators may apply a

learning theory-based approach to act as surrogates for parents uncertain of how to provide emotional and mental health support for their children with ASD. This strand of the research literature indicates that professional development materials allow school administrators to conduct detailed investigations from which therapeutic interventions will reduce deficits in social and communication skills (Fansler, 2018; Hammel & Hourigan, 2017; Oliver & Abel, 2017; Webster, Cumming, & Rowland, 2017).

However, professional development and training programs integrating a learning theory-based approach into music therapy interventions designed to improve social and communication skills must also provide several opportunities to emphasize how each type of intelligence overlaps (Cooney & Menezes, 2018; Lloyd, 2017). Music therapy interventions, when applied to facilitate cognitive and neurodevelopmental improvements, are significant for ensuring that children with ASD acquire emotional intelligence skills by imitating the emotion-based behaviors of others. Taken together, each of the theories explained here informs the processes of designing professional development and training curricular materials to improve administrative decision-making processes concerning how children with ASD should receive music therapy lessons over traditional education programs.

Professional Development and Training for Integrating Music Therapy Interventions

Several studies highlighting the impacts of music therapy for children with ASD have implications for designing effective professional development and training materials. Fansler (2018) reported the benefits of music therapy interventions for children

who experienced traumatic events. Trauma responses among children resemble those indicative of ASD to the extent that many school administrators express uncertainty regarding which professional development strategies and best practices will foster improvements to general learning outcomes (p. 2). Music therapy interventions that involved educators of children with ASD emphasizing traumatic experiences also highlighted the interrelationship between micro- and meso-systems. Depending on the relationship that children with ASD have with immediate family members, the professional development and training programs designed in collaboration between educators and school administrators must follow a systematic approach that considers individual- and group-level differences in outcomes.

Similarly, Klein and Kemper (2016) noted the likeness between music therapy and occupational therapy (OT) insomuch as both types of interventions improve social and communication skills when educators emphasize the acquisition of emotional intelligence. The similarities between music therapy and OT interventions are indicative of the resources available at each learning institution, professional experience, and outcome preferences among immediate family members. However, music therapy interventions differ from OT interventions when educators emphasize reciprocity in fostering improvements to social and communication skills among children with ASD. This strand of the research literature indicates further that professional development and training programs improve relationships between educators of children with ASD and school administrators when both work collaboratively to reduce deficits in the quality of dyadic parent-child relationships.

In line with the ToM and multiple intelligences approaches, music therapy interventions are useful for generating improvements to social and communication skills in children with ASD when educators and school administrators design professional development and training curricula that emphasizing bodily-kinesthetic intelligence. In concert with the study by Klein and Kemper (2016), the study by Karghand and Pour (2016) suggested that the approaches to professional development and training designed by educators of children with ASD in collaboration with school administrators should also apply to parents based on critical differences regarding improvements to social and communication skills. However, this strand of the research literature also indicates that educators may design professional development and training materials that emphasize perceptual-motor learning to foster improvements to therapeutic outcomes. Yet, educators are still responsible for ensuring that the learning activities included in the instructional curricula align with the individual and group-specific needs of children with ASD. Along these lines, Bieleninik et al. (2017) found that successful participation in music therapy interventions by children with ASD must involve educators emphasizing the acquisition of emotional intelligence when designing professional development and training materials. Yet, the types of interventions adopted by educators of children with ASD may or may not need to include learning modules that facilitate the development of improvisatory musical skills. Music therapy interventions may involve the efforts of parents and guidance counselors help educators of children with ASD improve professional behaviors.

The suggestion that parents and guidance counselors should influence the design of professional development and training programs comes from studies providing analyses of multi-sensory environments (MSEs) on children with ASD. Lee and Li (2016) described how MSEs provide aural and visual stimulation to children with developmental disabilities by encouraging parents, educators, guidance counselors, and school administrators with options for identifying key areas associated with improving the quality of life. MSEs help children with ASD alleviate the emotional and psychological stress that results from social stigmatization of developmental disabilities. Because children with ASD process aural and visual stimulation differently than children without the set of developmental disabilities, professional development and training programs designed from MSEs are effective to such an extent that parents, educators, guidance counselors, and school administrators report long-term empirical evidence of improvements to social and communication skills.

Along with MSEs, innovative technologies including Soundbeam are useful for educators who consider the empirical impacts of professional development and training programs designed in collaboration with school administrators. By defining Soundbeam as an innovative technological device that converts physical movement into sound, Lee (2015) suggested that professional development and training programs may inform the content included in music therapy interventions when educators emphasize the cultivation of bodily-kinesthetic intelligence. For educators who work with children who have severe forms of ASD, the Soundbeam device facilitates improvements to social and communication skills through the application of a noninvasive method. In line with the

theory of multiple intelligences, the emphasis on bodily-kinesthetic intelligence by educators of children with ASD entails that the quality of professional development and training programs depends on how well students, parents, guidance counselors, and school administrators respond to innovation. However, some of the research literature includes results suggesting that professional development and training programs emphasizing technological innovation are as effective as those emphasizing improvements to cognitive development and emotional expression.

Lim, Miller, and Ruiz (2014) noted how the goals and objectives of professional development and training programs should emphasize how educators of children with ASD emphasize improvements to social and communication skills. Especially for high-functioning children with ASD, professional development and training programs have significance for generating empirical improvements to learning outcomes, behavioral dispositions, and self-esteem. However, critical differences in the quality of professional development and training programs have significant implications for testing the assumptions of educators and school administrators who emphasize improvements to individualized learning outcomes (Hourigan, 2016; Lim et al., 2014). While children with ASD may benefit from using innovative technologies like Soundbeam, this group of students considered “at-risk” or “exceptional by guidance counselors and school administrators may, in effect, encourage educators to emphasize the use of traditional instruments in music therapy interventions (Hourigan, 2016; Lee, 2015; Lim et al., 2014, p. 30).

More interestingly, this strand of the research literature suggests that no formal musical training is necessary to design professional development and training programs that facilitate improvements to relationships between educators of children with ASD and school administrators. Despite how children with ASD are at-risk for exhibiting disruptive classroom behaviors, the empirical impacts of professional development and training programs indicate that educators may provide MSEs by designing instructional curricula and emphasizing different types of intelligence observed in classroom settings.

The impacts of professional development and training programs may also entail the integration of peer-mediation to foster long-term improvements to relationships between educators of children with ASD and school administrators. Mason et al. (2014) observed that peer-mediated social skills groups provide educators of children ASD to design extracurricular activities. Educators and faculty members including guidance counselors may work collaboratively by designing instructional activities inspired by a combination of traditional and innovative pedagogical methods (Lee, 2015; Mason et al., 2014). More specific to this project, Mason et al. (2014) suggested that professional development and training programs should highlight key differences between the baseline/pre-test and post-test measurements of improvements to social and communication skills in children with ASD. Accordingly, professional development and training programs facilitate improvements to reciprocal interpersonal interactions when educators and school administrators emphasize the relationship between individuals and their immediate physical environment.

In a similar vein, McFadden, Kamps, and Heitzman-Powell (2014) accounted for the importance of designing professional development and training materials to include evidence-based measures for improving relationships between educators of children with ASD and school administrators. Evidence-based measures included in professional development and training programs refer to direct instruction, priming, prompting, contingent reinforcement, and token economies (p. 1707). Each of these measures is applicable to peer-mediated recess sessions emphasizing improvements to dyadic parent-child and student-peer relationships. Yet, the empirical impacts of professional development and training programs designed to included evidence-based measures have implications for generalizing the empirical results to school administrators who may lack the causal knowledge of why children with ASD lack social and communication skills.

Empirical Results of Professional Development and Training Programs

Several studies highlight the empirical impacts of professional development and training programs designed to improve relationships between educators of children with ASD and school administrators. In conjunction with the broader music education literature, the empirical impacts of professional development and training programs have specific implications for designing curricular materials to enhance motor skills development in children with ASD insofar as peer-mediated interventions typically occur on an individual basis. Educators of children with ASD may integrate physical exercises into professional development and training materials to improve relationships with school administrators by emphasizing the relationship between motor skills development and bodily-kinesthetic intelligence (Lee, 2015; Lloyd, 2017; Srinivasan et al., 2015).

However, educators of children with ASD are responsible for designing professional development and training materials by coordinating music therapy interventions with school administrators and guidance counselors to ensure age appropriateness.

Along these lines, one study describing the empirical impacts of embodied rhythm and robotic interventions suggested that professional development and training programs designed by educators of children with ASD should reflect pedagogical standards for instituting a ten-week-long intervention. Srinivasan, Eigsti, Gifford, and Bhat (2016) conducted pre-test and post-test observations to identify critical improvements on standardized tests among children with ASD. Accordingly, the group of students who participated in the rhythm and robot interventions improved standardized test scores significantly while other forms of movement-based music therapy interventions were promising in enhancing verbal and non-verbal communication skills. Throughout the 10-week-long intervention, children with ASD who participated in the different interventions presented a higher attention span and improvements to verbal communication skills. Nonverbal communication skills improved moderately after educators delivered the rhythm and robot interventions. As such, this strand of the research literature highlights how educators of children with ASD may integrate a combination of innovative and traditional pedagogical methods to improve relationships with school administrators as well as with parents and guidance counselors.

In many ways, the study results by Srinivasan et al. (2016) are similar to those produced by Lee (2015) insomuch as innovative technological devices incentivize educators of children with ASD to design professional development and training

programs that emphasize the production of bodily-kinesthetic intelligence from participating in music therapy interventions. Empirically, professional development and training programs emphasizing the impacts of music therapy interventions during regular class hours and recess encourage educators of children with ASD and school administrators to collect resources for providing individualized attention (Lee, 2015; Mason et al., 2014; McFadden et al., 2014). The pedagogical resources used by educators of children with ASD are, nevertheless, significant for identifying how professional development and training programs have short- and long-term implications for prolonging the length of music therapy interventions. Likewise, researchers in special education continue to demonstrate how evidence-based measures produce results that inform the decision-making processes underpinning how educators of children with ASD design professional development and training programs. Camargo et al. (2014) noted how educators may draw from various pedagogical practices that provide evidence for designing professional development and training programs capable of fostering improvements in relationships with school administrators, parents, and guidance counselors. However, most of the music therapy interventions available to educators of children with ASD must follow an inclusive approach that provides empirical support for producing evidence-based outcomes.

In concert with the study by McFadden et al. (2014), a study by Camargo et al. (2014) includes evidence-based outcomes generalizable to broader populations of students with emotional, behavioral, and/or developmental issues. The suggestion to draw from this strand of the research literature is that music therapy interventions must

promote inclusiveness despite concerns about the exceptional status of children with ASD (Camargo et al., 2014; Hammel & Hourigan, 2017; Hourigan, 2016). Yet, this strand of the research literature also indicates that even more evidence-based outcomes are necessary to provide educators of children with ASD the tools and resources for delivering inclusive music therapy interventions in curricular and extra-curricular contexts (Eren, 2016). Furthermore, the empirical outcomes of music therapy interventions indicate that evidence-based practices must encourage educators to address critical behavioral differences between children who improve social and communication skills from receiving instructions in classroom and recess environments (Foley, 2017; Lee, 2015; Mason et al., 2014; McFadden et al., 2014). More specific to this project, the empirical and evidence-based outcomes of music therapy interventions for children with ASD are significant insomuch as the time and effort exercised by educators should also improve dyadic parent-child relationships and professional relationships with parents, guidance counselors, and school administrators. Here, the comparisons of improvements to social and communication skills between experimental and control groups are valuable for identifying which professional development strategies and best practices also improve relationships between educators of children with ASD and key stakeholders.

Especially after the post-test phase, the empirical results of professional development and training programs provide researchers in special education with valuable insights concerning the benefits of music therapy interventions. However, Ghasemtabar et al. (2015) noted how educators of children with ASD must identify which methodological weaknesses contribute to limitations in the overall effectiveness of

professional development and training programs. Educators of children with ASD may not necessarily know which types of cognitive development issues require ongoing attention after the post-test phase. Thus, the research literature evaluated here indicates that educators of children with ASD should consider designing professional development and training programs to ensure that school administrators, as well as guidance counselors, can identify direct observations of behavioral changes as providing a strong foundation for including evidence-based measures.

In a similar vein, the short- and medium-term empirical impacts of professional development and training programs indicate significant improvements to relationships between educators of children with ASD and school administrators when compared to placebo or traditional pedagogical interventions. Geretsegger, Elefant, Mössler, and Gold (2014) noted how even only one week of professional development and training may facilitate improvements when educators of children with ASD encourage school administrators to identify marked changes in cognitive and behavioral functioning. However, this strand of the research literature also suggests that the empirical outcomes of music therapy interventions illustrate how educators of children with ASD must demonstrate more active involvement in improving dyadic parent-child relationships as well as enhancing the quality of professional relationships with guidance counselors and school administrators. The following project description illustrates further how educators of children with ASD may design effective professional development and training programs but must ensure that improvements to relationships with school administrators, as well as with guidance counselors, facilitate the production of desired outcomes.

Project Description

This section will identify the necessary resources and existing supports, including potential barriers for implementing this project. This section will also address the potential barriers, the proposed implementation and timetable, and roles and responsibilities of the administrators and teachers in the project. Lastly, implications social change will be discussed.

Needed Resources

The resources required for the project study include the 3-day inservice PowerPoint, literature, administrators, and teachers. Prior proposing the 3-day inservice the plan must be presented and reviewed with the Superintendent and director of special services. By providing the purpose and foundation of the 3-day inservice PowerPoint with the Superintendent and director of special services it will ensure a positive approach to the implementation of music therapy with ASD children. A date will be scheduled for the Superintendent and director of special services review, including dates to deliver the 3-day inservice with the administrators and teachers at the elementary level. In order to develop the knowledge and foundation of ASD children and music therapy the PowerPoint presentation will highlight and explain information and facts on the benefits of using music therapy with ASD children. In addition, the presentation will support this research-based approach that by using music therapy with ASD children increases their social communicative skills. The PowerPoint presentation will summarize the data from this study and affirm that collaboration practices and leadership styles clearly influence the effectiveness of using music therapy with ASD children.

During the 3-day inservice, administrators and teachers will be provided a copy of the PowerPoint, with the purpose to provide them with a deep understanding of the process and implications on the benefits of using music therapy and how the intervention can improve social communication skills with ASD children.

Elementary regular and special education teachers and building administrators will attend and participate in the inservice because they will be the educators who institute and spearhead the music therapy in their classrooms and buildings. Each of the teachers attending the workshop will be key contributors by bringing their own individual talents and experiences to the process. Teachers will provide knowledge and feedback on past practices of building faculty, then becoming catalysts to establish new norms for the school.

This information will facilitate discussions with parents, guidance counselors, and school administrators regarding the utilization of professional development and training curriculum materials in both music therapy and traditional classroom interventions. Along these lines, information communication technologies (ICTs) are necessary for school administrators to discuss how innovative and traditional forms of knowledge may improve social and communication skills in children with ASD. School administrators may, therefore, actively participate in professional learning communities to discuss which forms of knowledge confer the most significant short- and long-term improvements to professional behaviors.

Potential Barriers

The lack of support from administrators and teachers can be a potential barrier of this project. They may not concur that music therapy supports the increase of social communicative skills with ASD children. Each group of administrators and educators may lack knowledge of ASD children and believe that their current approach and system to increase social communicative skills with ASD children is sufficient and supports student learning and achievement. In addition, teacher indifference could be present, which could stymp0ie teacher participation and negatively affect the views and perceptions of other teacher participants. Furthermore, principal leadership style may not support shared and supportive leadership approach to implement music therapy with ASD children. According to Marzano et al. (2005), effective building principals transmit belief in the personal and collective efficacy of educators they supervise through their beliefs, thoughts and actions. Effective educators do not always lead by rank but may lead through example and by being responsible and accountable for their actions. There is no doubt that teachers themselves prefer principals who are honest, communicative, participatory, collegial informal, supportive and demanding and reasonable in their expectations with a clear vision for the school - principals who accept their responsibilities and actions (Day, Harris, Hadfield, Tolley, & Beresford (2000).

Proposal for Implementation and Timetable

Administrators and teachers will participate and attend in a 3-day inservice professional development that concentrates on learning how music therapy with ASD children increases their social communicative skills. The goal 3-dayinserviceis to provide

educators with a deep understanding of children with autism and its implications on the benefits of using music therapy with ASD children and how the intervention increases their communication skills.

To effectively implement this 3-day inservice, the time needed would be three consecutive days during the summer. The first day of the inservice will include a presentation to administrators and teachers referencing the history of autistic children through the delivery of a PowerPoint presentation. This is an important piece of the presentation because ASD causes lifelong disabilities for affected individuals and significant burdens on their families, schools, and society. This will help educators understand about the case and expression of autism, the more we will be able to support children with autism and their families. The second day of inservice would consist of a PowerPoint and literature to support music therapy with the general population and ASD children. This part of the presentation will give a history of music therapy and how it affects the brain. Musical experiences strengthen many of the same aspects of brain function that are impaired in individuals with language and learning difficulties, such as the neural timing precision which allows differentiation between speech syllables. Lastly, on the third and final day of inservice this presentation will discuss my capstone study and how the study can help increase social communicative skills with ASD children in our district.

Roles and Responsibilities of Administrators, Teachers, and Others

The role as the researcher of this project is to be the main provider of information and lead facilitator in delivering the 3-day inservice to administrators and teachers. Prior

to the delivery of the 3-day inservice, the researcher will meet with the Superintendent and director of special services providing them copies of the PowerPoint presentation. During the inservice, the researcher's primary responsibility is to make certain that the administrators and teachers receive the PowerPoint presentation, as well as the facilitator and the manager of all the activities. The administrators and teachers will use the PowerPoint for reference during the 3-day inservice.

Project Evaluation Plan

For this project, a goals-based evaluation plan was executed to assure continuous improvement in professional development. Goals-based evaluation is intended to make professional development more effective and meaningful. Second, it establishes explicit criteria and to determine if the objectives have been achieved. The goal of this project is to provide a 3-day inservice to administrators and teachers about the effectiveness of using music therapy with ASD children to improve their social communicative skills. At the conclusion of the inservice, administrators and teachers will convene and collaborate to review and analyze student data, set goals, and develop a plan on how to incorporate music therapy into their buildings. This research-based approach identifies ways on how to incorporate music therapy in daily instruction improve social communicative skills in ASD children.

To determine the effectiveness of the 3-day inservice administrators and teachers will complete an evaluation form. The professional development evaluation form will consist of three subgroups of content, process, and context, which administrators and

teachers will answer. Administrators and teacher will respond to 12 items with *Strongly Agree, Agree, Neither Agree nor Disagree, Disagree,* or *Strongly Disagree.*

The evaluation will invite administrators and teachers to assess the 3-day inservice. The feedback received from the administrators and teachers will determine the effectiveness of my 3-day inservice.

Project Implications

The possible social change implications of this project indicate school administrators will likely benefit from participating in professional development and training programs designed improve learning outcomes in children with ASD. In turn, school administrators may perceive high-functioning children with ASD more positively in the short- and long-term. Cook, Ogden, and Winstone (2018) noted how children with ASD and neurotypical children demonstrate significant improvements to social and cognitive skills when educators designed professional development and training programs to decrease perceptions of victimization. Other possible social changes implications indicate how educators of children with ASD may integrate problem-based learning (PBL) strategies into professional development and training programs. Wanamaker (2019) noted how PBL strategies often follow state-mandated requirements to improve behaviors among students with developmental or emotional/behavioral disorders. By integrating PBL strategies, Wanamaker noted that educators of children with ASD are less likely to punish disruptive behaviors and, instead, attempt to identify the underlying root causes of behavioral and emotional dysregulation.

Section 4: Reflection and Conclusions

Introduction

In this section I reflect on the last 4 years of working and completing my project study. The purpose of this project was to provide districts with the challenge of addressing the needs of autistic children in classroom settings, while ensuring that these children become equipped with the knowledge and skills they will need to be successful once they leave school. The absence of functional communication skills, both verbal and nonverbal or prelinguistic, has been identified by the literature as essential to success both within and outside of the classroom. In addition, I discuss strengths and limitations of the project study. I also explain how the findings can be used to have a positive impact for social change.

Project Strengths

To address the problem in the project study, I investigated the effects of using music therapy to increase social communicative skills with ASD children. There are several different ways that the project showed strength through research-based evidence. By examining literature and collecting data, I addressed the problem in the project study to define specific strategies that have been proven effective with ASD children. The project was written in a language that is easy to understand for a practitioner to follow. The strategies are practical and easy to implement in any class setting.

The project was set up in a 3-day inservice format that is engaging. The administrators attending the 3-day inservice will provide information on the improved communication with children that may allow educators to gain a deeper connection to

them, thus providing insight into their academic and emotional needs. This may help teachers choose which techniques are most effective to improve the communicative responses of students with ASD.

Limitations

Although there were many strengths of this study, there were also limitations. Single-subject design usually require the removal of the treatment after several measurements to investigate if any effect of the treatment will continue. As it would have been unethical to withhold potential student support, this part of the single case study was not conducted.

Another limitation of this study was the small sample size. This was unavoidable, as the program I evaluated only exists in one school. Researchers would need to replicate the study with a larger number of teachers to add validity to these results. However, single-subject research designs are specialized for small samples. The fact that this study was conducted over a period of only 9 weeks may not have been enough time to see significant gains in areas such as students' eye gaze and joint attention. Additionally, because I was not personally assessing the students; I depended on the teachers' checklist of observed behaviors for each student. While the teachers' reporting can be assumed to be accurate, there may be inconsistencies in reporting if a teacher becomes momentarily distracted.

Another limitation of the study was that there was no opportunity for teachers to observe one another. Croft, Coggshall, Dolan, Powers, and Killion (2010) affirmed that observations give teachers immediate feedback on implementation of strategies so that they may be modified from one class to another within the same day. This practice would

need to be supported by the special services department and the district if class coverage is needed to implement this for teachers.

To address this limitation, participants can be grouped by the school for observation purposes. I was not looking at students in any other setting, or any other characteristics of the teachers. I delimited this study to one school district, as that was where the music therapy program was being conducted.

Recommendations for Alternative Approaches

The project is one way that I have addressed the need for further training for administrators and teachers in the area of autism. A second method is for all faculty to understand that change is critical for the success of all ASD students in the district. The district at which I am employed offers professional development opportunities each year for teachers and administrators. Many of these workshops focus on educational needs in the general education setting without looking deeper into the individual needs of the ASD child. Teachers need to be exposed to theories and research practices that have an impact on individualized student growth in the classroom settings. If teachers witness perceived social injustice and how important the absence of functional communication skills are both verbal and nonverbal has been a vital factor to the success both within and outside the classroom.

While many approaches to addressing this problem may exist, in my view my project will provide stakeholders with an easily assessible and cost-effective way for districts to implement this practice to address the needs of autistic children in the classroom setting.

Scholarship, Project Development and Leadership and Change

Throughout the project, I have become more critical of my scholarship and how to develop a project study. It takes a leader to develop a well thought project study with an active support system. I learned how much potential social change could result from future studies.

Scholarship

Throughout this journey, I learned that the doctoral study is a long process that requires time and perseverance. I was assigned a committee chair who was amazingly supportive through this process. The committee member was also insightful and committed to my success. I became frustrated and discouraged getting through URR and the IRB process. However, having the steady hand of my chair guiding me every step of the way, I was able to continue past all uncertainties. I realized that the URR and IRB approval could take much time. I submitted several changes to my original plan due to issues surrounding my responsibilities of the researcher and the rights of the participants of the study. Some of the revisions in my study plan that were needed to gain approval were things I had never considered. I learned much about the process of working through all ethical concerns with participants and being cognizant of their needs and rights.

My level of scholarships has expanded over the last 4 years. Even before I started work on this project study, the coursework related to this degree enabled me to develop in my professional and pedagogical practice. As my level of scholarship has expanded, so has the way I see and ponder new data. At the point when materials are introduced to me, I seek to discover validity and reliability in the research. My outlook on professional

development opportunities and how to approach them are vastly different. As an educator, I look to discover evidence-based practices that will enable me to reinforce my abilities as an administrator. Throughout the information gathering process, I understood the importance of being a life-long student, not only with my colleagues but also in my personal life with my family.

Project Development

The project study began with more students coming back into the district from out of district placement. Teachers do not get adequate training or focused research on best practices when they are focusing their time to plan and teach. Teachers are expected to locate resources and experiment with strategies that might work in their classrooms. Many articles regarding best practices exist, but teachers have limited time and energy to read and find ideas to assist them in their teaching. Educators today are overwhelmed just in dealing with the everyday challenges of meeting the needs of students with autism.

The study allowed me to learn how to develop a project and evaluation method for that project. As each phase was accomplished for this project study, I understood that sections had relevance and importance to each other. This relationship among the segments of the investigation enabled me to see the significance that a strong research question had on driving the information gathering, data examination, and study of the literature.

Leadership and Change

Throughout this process, I discovered that I must continually grow and change in order to be an effective leader. I must continue to grow as a lifelong learner. My goal as a

21st-century leader is to prepare better educators who are imaginative and innovative in their reasoning so that together we can bring about a positive outcome for students in an evolving classroom. The reason why I pursued this doctoral program was because I wanted to fortify my leadership skills. My leadership skills have been enhanced greatly over the course of this doctoral program. Completing this project study taught me the positive and negative aspects of leadership. As I observe the administration styles of others, I have been increasingly mindful of the effect that each style has on those who are managed. I have also recognized the power of leadership and how it can be used as a tool for construction or one for destruction. A strong leader can achieve extraordinary change by enabling others around them to succeed by giving them a vision, mission, and purpose. I have understood that change can happen by using proper techniques to look at an issue and cooperatively finding a way to an answer. These insights have supported my role as one that empowers others while we work collaboratively to solve a problem. Hoyes (2014) stated that to become an effective leader, a person must be willing to be on the cutting edge in their thought processes. Educators should be innovative thinkers so together we can make an impact on students.

Analysis of Self as Scholar

Administrators are encouraged to reflect upon their practice on a regular basis to improve their leadership skills. The reflection process allows practicing administrators the ability to become more analytical and use self-evaluation techniques. The idea of self-efficacy can be a large part of this reflection process (Yoo, 2016). If an educator trusts that a specific objective is feasible, the person in question is bound to achieve that

objective. I trust that I can improve as a researcher with more experience. The theory of self-efficacy is already taking effect in my own practice. I have started to thoroughly consider thoughts and issues through the viewpoint of a researcher rather than entirely as an instructor.

As an administrator, I am continually requesting that my staff reflect upon the lessons they teach in the field. I ask that they ponder the positive and negative parts of their instruction and reflect so they may advance to the next level with their teaching ability. I pursue this same principle in reviewing my own leadership skills. As administrators and teachers self-reflect, they can enhance their instruction and improve relationships with the students.

I am self-motivated and keen on extending myself to become more of a scholar. I intend to take the findings of this study and present them at a 3-day inservice for administrators and teachers. I anticipate seeing myself develop more as a researcher because of my time here at Walden.

Analysis of Self as Practitioner

I began my career as a paraprofessional in self-contained multiple disabled classroom. I was very passionate about teaching children with special needs and making a positive impact upon their lives. Working collaboratively with my colleagues, we were able to meet the needs of my students. It was very rewarding role that prepared me for my role as a teacher and a life-long learner as an educator.

I was very passionate about working with students with specials needs in the K-5 arena. I had taught for 6 years in a resource setting in a urban district. I knew I was ready

to pursue the next level. I had the creditably needed for your future teachers to trust and I can guide and mold them into educators. Being an administrator, I can practice my art of being a teacher of teachers. In addition, I learned how to improve the efficiency and equity of schooling. Within each individual school, my leadership contribute to improve student learning by shaping the conditions and climate in which teaching, and learning occur. Beyond the school borders, school leaders can connect and adapt schools to changing external environments. And at the school-systems interface, school leadership provides a bridge between internal school improvements processes and externally initiated reform. With the completion of this program, I will be able to move forward into my career and continue to do my life's work.

Analysis of Self as Project Developer

As a building administrator, I have worked in the development of new programs and projects. With this project, I was the only originator. I have consulted with my chair and committee, but this idea and execution has been my own undertaking.

Throughout my career in education, children with special needs are being place in the least restrictive environment. The director of special services is bringing back students with ASD to public school setting. Administrators are seeing an influx of students with ASD that are placed in their buildings. As I began my study, I knew that educators were seeking different ways to help increase social communicative skills with ASD children.

As I gathered more information, I had not in any case thought that my ideas could transform into something that could support administrators and teachers to become more

cognizant of the needs of students with autism and provide strategies to help them in their endeavors. Due to my experience with trainings that contained no engagement, I wanted to make sure the 3-day inservice was engaging and enjoyable for administrators and teachers to attend. As the project developer, I realize the importance of including the research behind the strategies. I am satisfied in designing this project was professionally completed and I am sure will be a practice that I continue in the future.

Reflection on the Importance of the Work

As I complete this journey, I have learned many things about myself as an administrator and as a scholar. One thing I have learned is that quality research takes time. As I reflect on the importance of this work, there are a lot of children dealing with the effects of autism daily. The effects of a growing number of students with autism have reached classroom and teachers are not adequately prepared.

This 3-day inservice will give administrators and teachers the tools they need to further their knowledge about the social communicative skills of autism. A future goal is to offer this 3-day inservice to every staff member of my public school district as a means of professional development. My anticipation is that administrator and teachers who are looking for answers in addressing the needs of children with autism in their classroom will have access to several resources and techniques readily available. They may not need to invest hours looking into related articles, videos, and teaching tips. Present and future teachers can have the advantage of getting information created through the thoughts established through this doctoral study.

Implications, Applications, and Directions for Future Research

The significance of this work lies in the way that it impacts the lives of students. During this research study, music therapy was identified having a positive impact on the success of a student with ASD. Music therapy provided practical application to address communication and social skill concerns. The implications of this study rely on administrators and teachers wanting to improve their own professional practice. The application of music therapy with ASD children presented in this study has the potential to affect the success in the classroom. However, the effect of the intervention will only be successful to the extent in which they are carried out. If the intervention is not implemented with precision and consistently the application of this project study has been nominal. On the other hand, those educators who implement the intervention in their entirety and with fidelity will find more use for the results of this study.

Implications for Social Change

This study has potential for social change at the local level and potentially beyond. According to Theoharis (2010), the first step in providing social justice for students with disabilities is not to adhere to the status quo and not be reluctant to make changes towards social justice for the rights of students. This moral commitment to create a setting were students with disabilities are in an environment that is most conducive to learn and stimulating for all students. I submit that social justice is not reached by the belief that they would learn the ways of the mainstream culture. It is attained by giving administrators and teachers the information and resources needed to educate autistic

students to increase their social communicative skills so they may achieve their full potential.

Future Research and Applications

The implication for future research incorporates includes the continuous goal of enhancing one's craft through research-based methodologies. Although several strategies were mentioned in this project study, future research needs to be conducted on the effectiveness of using music therapy to increase social communicative skills with ASD children.

Conclusion

This section was an explanation of the strengths and weaknesses of this project study. I also discussed by development as a project developer and scholar. The 4 years that I have focused on growing as a leader has culminated in this study that provides answers to administrators and teachers who have been struggling with the meeting the social communicative needs of students with ASD. Furthermore, this section included a reflection of what I learned during the doctoral processes regrading scholarship, development of a study and the learning and teaching practice. The study and results have already had a tremendous impact on my leadership as an administrator and my fellow colleagues. Most of the district sponsored professional development from the special education department are mandated items like restraint training for special education teachers and paraprofessionals. Through the implementation of the professional development project that was developed in response to the study, administrator and teacher's self -efficacy may increase which may result in student's intervention that may

be used with this population of students. Finally, this study adds to the scholarly literature regarding interventions and therapy for children with ASD. As future scholars look to affect change of their own, they may build upon this study.

References

Accordino, R., Comer, R., & Heller, W. B. (2007). Searching for music's potential: A critical examination of research on music therapy with individuals with autism. *Research in Autism Spectrum Disorders, 1*(1), 101-115. doi:10.1016/j.rasd.2006.08.002

Anderson, Z., & Morris, L. (2006). Cognitive behavior therapy for people with Asperger syndrome. *Behavioral and Cognitive Psychotherapy, 34,* 293-303. doi:10.1017/s1352465805002651

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.) . Arlington, VA: American Psychiatric Publishing.

Armstrong, K., DeLoatche, K.J., Preece, K.K., & Agazzi, H. (2014). Combining interaction therapy and visual supports for the treatment of challenging behavior in a child with autism. *Clinical Case Studies, 14*(1), 3-14.

Autism Research Institute. (2017). *Autism Research Institute: 40 years of Hope and Success*.

National Autistic Society (2015). What is autism? Retrieved on January 3, 2017, from http://www.autism.org.uk/about-autism/autism-and-asperger-syndrome-an-introduction/what-is-autism.aspx.

Bartlett, D., Kaufman, D., & Smeltekop, R. (2014). The effects of music listening and perceived sensory experiences on the immune system as measured by Interleukin-1 and Cortisol 1. *Journal of Music Therapy, 30*(4), 194–209. doi:10.1093/jmt/30.4.194

Berney, T. (2014). Asperger syndrome from childhood into adulthood. *Advances in Psychiatric Treatment, 10,* 341-351. doi:10.1192/apt.10.5.341

Bieleninik, Ł., Geretsegger, M., Mössler, K., Assmus, J., Thompson, G., Gattino, G., . . . Muratori, F. (2017). Effects of improvisational music therapy vs enhanced standard care on symptom severity among children with autism spectrum disorder: the TIME-A randomized clinical trial. *JAMA, 318*(6), 525-535. doi:10.1001/jama.2017.9478

Birman, B. F., Kirshstein, R. J., Levin, D. A., Matheson, N., & Stephens, M. (1997). *The effectiveness of using technology in K-12 education: A preliminary framework and review.* Paper prepared for the U.S. Department of Education, Office of Educational Research and Improvement.

Birman, B., Desimone, Garet, M., & Porter, A. (2000). Designing professional development that works. *Educational Leadership, 57*(8), 28-33.

Blood, G. W., Blood, I. M., Coniglio, A. D., Finke, E. H., & Boyle, M. P. (2013). Familiarity breeds support: Speech-language pathologists' perceptions of bullying of students with autism spectrum disorders. *Journal of Communication Disorders, 46*(2), 169-180. doi:10.1016/j.jcomdis.2013.01.002

Borenstein, M., Hedges, L. V., Higgings, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis.* Chichester, United Kingdom: Wiley.

Boso, M., Emanuele, E., Minazzi, V., Abbamonte, M., & Politi, P. (2007). Effect of long-term interactive music therapy on behavior profile and musical skills in young

adults with severe autism. *Journal of Alternative and Complementary Medicine, 13*(7), 709-712. doi:10.1089/acm.2006.6334

Bouck, E. C., Satsangi, R., Doughty, T. T., & Courtney, W. T. (2014). Virtual and concrete manipulatives: A comparison of approaches for solving mathematics problems for students with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 44*(1), 180-193. doi:10.1007/s10803-013-1863-2

Bronfenbrenner, U. (1992). Ecological systems theory. In R. Vasta (Ed.), *Six theories of child development: Revised formulations and current issues*, 187-249. London, England: Jessica Kingsley Publishers.

Bruscia, K. (Ed.). (2012) *Readings on music therapy theory.* Gilsum, NH: Barcelona Publishers.

Byiers, B & R., Joe & Symons, F. (2012). Single-Subject Experimental Design for Evidence-Based Practice. *American Journal of Speech-Language pathology/American Speech-Language-Hearing Association*. 21.

Camargo, S. P. H., Rispoli, M., Ganz, J., Hong, E. R., Davis, H., & Mason, R. (2014). A review of the quality of behaviorally-based intervention research to improve social interaction skills of children with ASD in inclusive settings. *Journal of Autism and Developmental Disorders, 44*(9), 2096-2116. doi:10.1007/10803-014-2060-7

Carpenter, M., & Tomasello, M. (2000). Joint attention, cultural learning, and language acquisition: Implications for children with autism. In A. M. Wetherby & B. M. Prizant, (Eds). *Autism spectrum disorders: A transactional developmental*

perspective. Communication and language intervention series. (pp. 31-54). Baltimore, MD: Paul H. Brookes Publishing Co.

Centers for Disease Control and Prevention. (2014, March). CDC estimates 1 in 68 children has been identified with autism spectrum disorder [Press release]. Retrieved from https://www.cdc.gov/media/releases/2014/p0327-autism-spectrum-disorder.html

Charlop-Christy, M., Carpenter, M., Le, L., LeBlanc, L., & Kellet, K. (2002). Using the picture exchange communication system (PECS) with children with autism: assessment of PECS acquisition, speech, social communicative behavior, and problem behavior. *Journal of Applied Behavior Analysis, 35*(3), 213-231. doi:10.1901/jaba.2002.35-213

Cook, A., Ogden, J., & Winstone, N. (2018). The impact of a school-based musical contact intervention on prosocial attitudes, emotions and behaviours: A pilot trial with autistic and neurotypical children. *Autism.* Advance online publication. doi:10.1177/1362361318787793

Cooney, M. D., & Menezes, M. L. R. (2018). Design for an art therapy robot: An explorative review of the theoretical foundations for engaging in emotional and creative painting with a robot. *Multimodal Technologies and Interaction, 2,* 52-90. doi:10.3390/mti2030052

Cooper, H., Hedges, L. V., & Valentine, J. C. (2009). *The handbook of research synthesis and meta-analysis.* New York, NY: Russell Sage Foundation.

Crane, H. (2015). *Music therapy and the treatment of children diagnosed with autism spectrum disorder.* Retrieved from mospace.umsystem.edu.

Creswell, J. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches.* Los Angeles, CA: Sage Publications.

Creswell, J. (2016). *30 Essential skills for the qualitative researcher.* Los Angeles, CA: Sage Publications.

Croft, A., Coggshall, J. G., Dolan, M., & Powers, E. (2010). Job-Embedded Professional Development: What It Is, Who Is Responsible, and How to Get It Done Well. Issue Brief. *National Comprehensive Center for Teacher Quality*.

Dawson, G., Bernier, R., R.H., & Ring, R.H. (2014). Social attention: a possible early indicator of efficacy in autism clinical trials. *Journal of Neurodevelopmental Disorders, 4*(11). doi:10.1186/1866-1955-4-11

Day, C., Harris, A., Hadfield, M., Tolley, H., & Beresford, J. (2000). *Leading schools in times of change.* Buckingham, United Kingdom: Open University Press.

Delaherche E, Chetouani M, Mahdhaoui A, Saint-Georges C, Viaux S, & Cohen D. (2012). Interpersonal synchrony: A survey of evaluation methods across disciplines. *IEEE Trans Affect Computer, 3,* 349–365. doi:10.1109/t-affc.2012.12

Dimitrov, D. M., & Rumrill Jr., P. D. (2003). Pretest-posttest designs and measurement of change. *Work, 20*(2), 159-165.

Doheny, K. (2008, March 28). *Autism cases on the rise; Reason for increase a mystery.* Retrieved from WebMD website: https://www.webmd.com/brain/autism/searching-for-answers/autism-rise

Eren, B. (2015). The use of music interventions to improve social skills in adolescents with autism spectrum disorders in integrated group music therapy sessions. *Procedia–Social and Behavioral Sciences, 197,* 207-213. doi:10.1016/j.sbspro.2015.07.125

Ettlinger, M., Margulis, & E., Wong, P. (2011). Implicit memory in music and language. *Frontiers in Psychology, 2*(211), 1-10. doi:10.3389/fpsyg.2011.00211

Fansler, V. (2018). Musical assessment of child perceptions in changing family situations. *Voices: A World Forum for Music Therapy, 18*(4), 1-15. doi:10.15845/voices.v18i4.2603

Ferraioli, S. J., & Harris, S. L. (2011). Effective educational inclusion of students on the autism spectrum. *Journal of Contemporary Psychotherapy, 41*(1), 19-28. doi:10.1007/s10879-010-9156-y

Field, A. (2013). *Discovering statistics using SPSS* (4th ed.). Thousand Oaks, CA: Sage Publications.

Finnigan, E., & Starr, E. (2010). Increasing social responsiveness in a child with autism A comparison of music and non-music interventions. *Autism, 14*(4), 321-348. doi:10.1177/1362361309357747

Fitzpatrick, E. M., Lambert, L., Whittingham, J., & Leblanc, E. (2014). Examination of characteristics and management of children with hearing loss and autism spectrum disorders. *International Journal of Audiology, 53*(9), 577-586. doi:10.3109/14992027.2014.903338

Foley, S. V. (2017). Music education and its impact on students with special needs. *Scholarship and Engagement in Education, 1*(1), 1-7. Retrieved from https://scholar.dominican.edu/cgi/viewcontent.cgi?article=1012&context=seed

Frea, W. D., Arnold, C. L., & Vittimberga, G. L. (2001). A demonstration of the effects of augmentative communication on the extreme aggressive behavior of a child with Autism within an integrated preschool setting. *Journal of Positive Behavior Intervention, 3,* 194–198. doi:10.1177/109830070100300401

Gambino, G. (2014). The autism spectrum disorders (ASD). *Italian Journal of Pediatrics 40*(S1). doi:10.1186/1824-7288-40-S1-A67

Gattino, G. S., Riesgo, R. d. S., Longo, D., Leite, J. C. L., & Faccini, L. S. (2011). Effects of relational music therapy on communication of children with autism: a randomized controlled study. *Nordic Journal of Music Therapy, 20*(2), 142-154. doi:10.1080/08098131.2011.566933

Geist, K., Geist, E. (2012). Bridging music neuroscience evidence to music therapy best practice in the early childhood classroom: Implications for using rhythm to increase attention and learning. *Music Therapy Perspectives, 30*(2), 141-144.

Geretsegger, M., Elefant, C., Mössler, K. A., & Gold, C. (2014). Music therapy for people with autism spectrum disorder. *Cochrane Library, 6,* 1-66.

Geretsegger, M., Holck, U., Bieleninik, Ł., & Gold, C. (2016). Feasibility of a trial on improvisational music therapy for children with autism spectrum disorder. *Journal of Music Therapy, 53*(2), 93-120. doi:10.1093/jmt/thv038

Glass, G. V. (1976). Primary, secondary, and meta-analysis of research. *Educational Researcher, 5*(10), 3-8.

Guskey, T. (1999). Apply time with wisdom. *Journal of Staff Development, 20*(2), 10-15.

Guskey, T. (2010). Lessons of mastery learning. *Educational Leadership, 68*(2), 53-57. Retrieved from https://www.researchgate.net/publication/236273526_Lessons_of_Mastery_Learning

Hammel, A. M., & Hourigan, R. M. (2017). *Teaching music to students with special needs: A label-free approach* (2nd ed.). New York, NY: Oxford University Press.

Hansen, S. G., Blakely, A. W., Dolata, J. K., Raulston, T., & Machalicek, W. (2014). Children with autism in the inclusive preschool classroom: A systematic review of single-subject design interventions on social communication skills. *Review Journal of Autism and Developmental Disorders, 1*(3), 192-206. doi:10.1007/s40489-014-0020-y

Hildén, K., Ardila-Mantilla, N., Bolliger, T., Francois, J.-C., Lennon, M., Reed, G., Stolte, T. & Stone, T. (2010). *Instrumental and Vocal Teacher Education: European perspectives.* Amsterdam, Netherlands: AEC Publications.

Hirvikoski, T., & Blomqvist, M. (2015). High self-perceived stress and poor coping in intellectually able adults with autism spectrum disorder. *Autism, 19*(6), 752-757. doi:10.1177/1362361314543530

Hitoglou, M., Ververi, A., Antoniadis, A., & Zafeiriou, D. I. (2010). Childhood autism and auditory system abnormalities. *Pediatric Neurology, 42*(5), 309-314.

Hopkins, I. M., Gower, M. W., Perez, T. A., Smith, D. S., Amthor, F. R., Wimsatt, F. C., & Biasini, F. J. (2011). Avatar assistant: improving social skills in students with an ASD through a computer-based intervention. *Journal of Autism and Developmental Disorders, 41*(11), 1543-1555. doi:10.1007/s10803-011-1179-z

Hourigan, R. M. (2016). Lessons learned from the Prism Project: Pedagogical viewpoints in music education for teaching students with autism spectrum disorder. In D. V. Blair & K. A. McCord (Eds.), *Exceptional music pedagogy for children with exceptionalities: International perspectives* (pp. 61-84). New York, NY: Oxford University Press.

Hoyes, M. (2014). Seeing clearly—The first tool for leadership/organizational creativity. *Journal of Strategic Leadership, 5*(1), 59-66. Retrieved from https://www.regent.edu/acad/global/publications/jsl/vol5iss1/hoyes.pdf

Individuals with Disabilities Education Act of 1997, Pub. L. No. 105-17, 111 Stat. 37 (1997)

Ingram, G. (2009). The healing power of music. *Therapy Today, 20*(7), 42-43.

James, R., Sigafoos, J., Green, V. A., Lancioni, G. E., O'Reilly, M. F., Lang, R., . . . Marschik, P. B. (2015). Music therapy for individuals with autism spectrum disorder: A systematic review. *Review Journal of Autism and Developmental Disorders, 2*(1), 39-54. doi:10.1007/s40489-014-0035-4

Jenkins, A. A., & Yoshimura, J. (2010). Not Another Inservice: Meeting the Special Education Professional Development Needs of General Elementary Educators. *Teaching Exceptional Children, 42*, 36–43.

Kalas, A. (2012). Joint attention responses of children with autism spectrum disorder to simple versus complex music. *Journal of Music Therapy, 49*(4), 430-452. doi:10.1093/jmt/49.4.430

Karghand, Z. A., & Pour, M. E. (2016). The effect of perceptual-motor activities training on adaptive behavior of autistic children. *International Journal of Fundamental Psychology and Social Sciences, 6*(3), 23-26. doi:10.14331/ijfpss.2016.330060

Kern, P., & Tague, D. B. (2017). Music therapy practice status and trends worldwide: An international survey study. *Journal of Music Therapy, 54*(3), 255-286. doi:10.1093/jmt/thx011

Kim, J., Wigram, T., & Gold, C. (2008). The effects of improvisational music therapy on joint attention behaviors in autistic children: a randomized controlled study. *Journal of Autism and Developmental Disorders, 38*(9), 1758-1766. doi:10.1007/s10803-008-0566-6

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. doi:10.1177/1362361309105660

Klein, N., & Kemper, K. J. (2016). Integrative approaches to caring for children with autism. *Current Problems in Pediatric and Adolescent Health Care, 46*(6, 195-201. doi:10.1016/j.cppeds.2015.12.004

Koelsch, S. (2015). Music□evoked emotions: principles, brain correlates, and implications for therapy. *Annals of the New York Academy of Sciences, 1337*(1), 193-201. doi:10.1111/nyas.12684

Kratochwill, T., Hitchcock, H., Horner J., Odom, S., Rindskopf, D. M., & Shadish, W. S. (2013). Single-case intervention research design standards. *Remedial and Special Education. 34,* 26-38. doi:10.1177/0741932512452794

Kuo, C.-C., Lin, C. I-T., Kuo, B.-J., Kuang, C.-C., & Dai, L.-T. (2016). Learning experiences of young artists with ASD in a university enrichment program. *Universal Journal of Educational Research*, *4*(9), 2144-2162. doi: 10.13189/ujer.2016.040927LaGasse, A. B. (2014). Effects of a music therapy group intervention on enhancing social skills in children with autism. *Journal of Music Therapy, 51*(3), 250-275. doi:10.1093/jmt/thu012

Lane, J. & Gast, D. (2013). Visual analysis in single case experimental design studies: Brief review and guidelines. *Neuropsychological rehabilitation*. 24. doi: 10.1080/09602011.2013.815636

Lee, G. K., & Carter, E. W. (2012). Preparing transition□age students with high□ functioning autism spectrum disorders for meaningful work. *Psychology in the Schools, 49*(10), 988-1000. doi:10.1002/pits.21651

Lenz, A. S. (2013). Calculating Effect Size in Single-Case Research: A Comparison of Nonoverlap Methods. *Measurement and Evaluation in Counseling and Development, 46*(1), 64–73. https://doi.org/10.1177/0748175612456401

Lim, H., Miller, K., & Ruiz, S. (2014). Effects of music therapy and piano lesson on academic achievement, classroom behaviors, and self-esteem of at-risk students: A pilot study. *GSTF International Journal of Music, 1*(1), 30-37. doi:10.5176/0000-0005_1.1.5

Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis.* Thousand Oaks, CA: Sage Publications.

Lloyd, K. (2017). Benefits of art education: A review of the literature. *Scholarship and Engagement in Education, 1*(1), 6. Retrieved from http://scholar.dominican.edu/cgi/viewcontent.cgi?article=1015&context=seed

Low, H.M., & Lee, L.W. (2011). Teaching of speech, language and communication skills for young children with severe autism spectrum disorders: What do educators need to know? *New Horizons in Education, 59*(3), 16-27.

Ludlow, A., Mohr, B., Whitmore, A., Garagnani, M., Pulvermuller, F., & Gutierrez, R. (2014). Auditory processing and sensory behaviors in children with autism spectrum disorders as revealed by mismatch negativity. *Brain and Cognition, 86,* 55-63. doi:10.1016/j.bandc.2014.01.016

Marshall, C. & Rossman, G. (2016). *Designing qualitative approach.* Los Angeles CA: Sage Publishers.

Mason, R., Kamps, D., Turcotte, A., Cox, S., Feldmiller, S., & Miller, T. (2014). Peer mediation to increase communication and interaction at recess for students with autism spectrum disorders. *Research in Autism Spectrum Disorders, 8*(3), 334-344. doi:10.1016/j.rasd.2013.12.014

Maestro, S., Muratori, F., Cavallaro, M.C., Pei, F., Stern, D. (2013). Attentional skills during in autism spectrum disorder. *Journal of the American Academy of Child & Adolescent Psychiatry, 41*(10), 1239-1245.

Manno, F., Fernandez-Ruiz, J., Barrios, F. (2017). Hemispheric lateralization of Heschl's gyrus and amygdala subdivisions are involved in differentiating happy and sad acoustic emotion. *Neuropsychologia, 27*(4), 65–684.

Martin, C. J. H. (2014). A narrative literature review of the therapeutic effects of music upon childbearing women and neonates. *Complementary Therapies in Clinical Practice, 20*(4), 262-267. doi:10.1016/j.ctcp.2014.07.011

Marshall, C., & Rossman, G. (2016). *Designing qualitative approach.* Thousand Oaks, CA: Sage Publishers.

McCann, J., Peppé, S., Gibbon, F. E., O'Hare, A., & Rutherford, M. (2007). Prosody and its relationship to language in school□aged children with high□functioning autism. *International Journal of Language & Communication Disorders, 42*(6), 682-702. doi:10.1080/13682820601170102

McFadden, B., Kamps, D., & Heitzman-Powell, L. (2014). Social communication effects of peer-mediated recess intervention for children with autism. *Research in Autism Spectrum Disorders, 8*(12), 1699-1712. doi:10.1016/j.rasd.2014.08.015

Mpella, M., & Evaggelinou, C. (2018). Does theatrical play promote social skills development in students with autism? A systematic review of the methods and measures employed in the literature. *Preschool & Primary Education, 6*(2), 96-118. doi:10.12681/ppej.16135

National Institute on Deafness and Other Communication Disorders. National Institutes of Health, National Institute of Mental Health. (2017). *NIMH Strategic Plan for*

Research (NIH Publication No. 02-2650). Retrieved from http://www.nimh.nih.gov/about/strategic-planning-reports/index.shtml

O'Connor, K. (2012). Auditory processing in autism spectrum disorder: A review. *Neuroscience & Biobehavioral Reviews, 36*(2), 836-854. doi:10.1016/j.neubiorev.2011.11.008

Oliver, B., & Abel, N. (2017). Special populations of children and adolescents who have significant needs. In J. Ziomek-Daigle (Ed.), *Counseling children and adolescents: Working in school and clinical mental health settings* (pp. 371-407). New York, NY: Routledge.

Pasiali, V. (2012). Supporting parent-child interactions: Music therapy as an intervention for promoting mutually responsive orientation. *Journal of Music Therapy, 49*(3), 303-334.

Quill, K. A. (2000). *Do-watch-listen-say: Social and communication intervention for children with autism.* Baltimore, MD: Paul H. Brookes Publishing Co.

Quill, K. A., Norton Bracken, K. & Fair, M. E. (2000). Assessment of Social and Communication Skills for Children with Autism. In K.A. Quill, *Do-watch-listen-say: Social and communication intervention for children with autism.* Baltimore, MD: Paul H. Brookes Publishing Co.

Raglio, A., Bellelli, G., Mazzola, P., Bellandi, D., Giovagnoli, A., Farina, E., . . . Trabucchi, M. (2012). Music, music therapy and dementia: a review of literature and the recommendations of the Italian Psychogeriatric Association. *Maturitas, 72*(4), 305-310. https://doi.org/10.1016/j.maturitas.2012.05.016

Raglio, A., Oasi, O., Gianotti, M., Rossi, A., Goulene, K., & Stramba-Badiale, M. (2016). Improvement of spontaneous language in stroke patients with chronic aphasia treated with music therapy: a randomized controlled trial. *International Journal of Neuroscience, 126*(3), 235-242. doi:10.3109/00207454.2015.1010647

Reichow, B., & Volkmar, F.R. (2014). Social skills interventions for individuals with autism: evaluation for evidence-based practices within a best evidence synthesis framework. *Journal of Autism and Developmental Disorders, 40*(2), 149-166.

Rickard, N. S. (2004). Intense emotional responses to music: a test of the physiological arousal hypothesis. *Psychology of Music, 32*(4), 371-388.

Roper, L., Arnold, P., & Monteiro, B. (2003). Co-occurrence of autism and deafness: Diagnostic considerations. *Autism, 7*(3), 245-253.

Rosenhall, U., Nordin, V., Sandström, M., Ahlsen, G., & Gillberg, C. (1999). Autism and hearing loss. *Journal of Autism and Developmental Disorders*, 29(5), 349-357.

Salvador, K. (2015). Music instruction for elementary students with moderate to severe cognitive impairments. *Research Studies in Music Education, 37*(2), 161-174. doi:10.1177/1321103X15613645

Schmid, R. F., Bernard, R. M., Borokhovski, E., Tamim, R. M., Abrami, P. C., Surkes, M. A., . . . Woods, J. (2014). The effects of technology use in postsecondary education: A meta-analysis of classroom applications. *Computers & Education, 72,* 271-291.

Schreibman, L., & Stahmer, A. (2014). A randomized trial comparison of the effects of verbal and pictorial naturalistic communication strategies on spoken language for

young children with autism. *Journal of Autism and Developmental Disorders, 44*(5), 1244-1251. doi:10.1007/s10803-013-1972-y

Scruggs, T. E., & Mastropieri, M. A. (2013). How to summarize single-participant research: Ideas and applications. *Exceptionality*, 9, 227–244. doi:10.1207/S15327035EX0904_5

Shakespeare, W. (1992). *Complete works.* New York, NY: Harper Collins.

Shi, Z.-M., Lin, G.-H., & Xie, Q. (2016). Effects of music therapy on mood, language, behavior, and social skills in children with autism: A meta-analysis. *Chinese Nursing Research, 3*(3), 137-141. doi:10.1016/j.cnre.2016.06.018

Smith,G. (2013). Single-subject designs in special education: Advantages and limitations. *Journal of Research in Special Educational Needs*, 15. doi: 10.1111/1471-3802.12039.

Srinivasan, S. M., Eigsti, I.-M., Gifford, T., & Bhat, A. N. (2016). The effects of embodied rhythm and robotic interventions on the spontaneous and responsive verbal communication skills of children with autism spectrum disorder (ASD): A further outcome of a pilot randomized controlled trial. *Research in Autism Spectrum Disorders, 27,* 73-87. doi:10.1016/j.rasd.2016.04.001

Srinivasan, S. M., Kaur, M., Park, I. K., Gifford, T. D., Marsh, K. L., & Bhat, A. N. (2015). The effects of rhythm and robotic interventions on the imitation/praxis, interpersonal synchrony, and motor performance of children with autism spectrum disorder (ASD): A pilot randomized controlled trial. *Autism Research and Treatment, 2015,* 1-19. doi:10.1155/2015/736516

Strehlow, G., & Lindner, R. (2016). Music therapy interaction patterns in relation to borderline personality disorder (BPD) patients. *Nordic Journal of Music Therapy, 25*(2), 134-158.

Szymanski, C. A., Brice, P. J., Lam, K. H., & Hotto, S. A. (2012). Deaf children with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 42*(10), 2027-2037. doi:10.1007/s10803-012-1452-9

Taheri, L., Jahromi, M. K., Abbasi, M., & Hojat, M. (2017). Effect of recorded male lullaby on physiologic response of neonates in NICU. *Applied Nursing Research, 33,* 127-130. doi:10.1016/j.apnr.2016.11.003

Thompson, G., McFerran, K., & Gold, C. (2014). Family□centered music therapy to promote social engagement in young children with severe autism spectrum disorder: A randomized controlled study. *Child: Care, Health and Development, 40*(6), 840-852. doi:10.1111/cch.12121

Theoharis, G. (2010). Disrupting injustice: Principals narrate the strategies they use to improve their student and advance social justice. *Teachers College Record, 112*(1), 331-373. Retrieved from http://www.4j.lane.edu/wp-content/uploads/2014/08/Disrupting-Injustice.pdf

Ueda, T., Suzukamo, Y., Sato, M., & Izumi, S.-I. (2013). Effects of music therapy on behavioral and psychological symptoms of dementia: a systematic review and meta-analysis. *Ageing Research Reviews, 12*(2), 628-641. doi:10.1016/j.arr.2013.02.003

Vannest, K. J. and Ninci, J. (2015), Evaluating Intervention Effects in Single□Case Research Designs. *Journal of Counseling & Development*, 93, 403-411. doi:10.1002/jcad.12038

Venuti, P., Bentenuto, A., Cainelli, S., Landi, I., Suvini, F., Tancredi, R. . . . Muratori, F. (2017). A joint behavioral and emotive analysis of synchrony in music therapy of children with autism spectrum disorders. *Health Psychology Report, 5*(2), 162-172. doi:10.5114/hpr.2017.63985

Volkmar, F. R. & Klin, A. (1994). Social development in autism: Historical and clinical perspectives. In S. Baron-Cohen & H. Tager-Flusberg, (Eds), *Understanding other minds: Perspectives from autism* (pp. 40-55). London, United Kingdom: Oxford University Press.

Wanamaker, T. S. (2019). Using problem-based learning to address behavior and curricular issues in the self-contained music classroom. In N. Sarrazin (Ed.), *Problem-based learning in the college music classroom* (pp. 157-177). New York, NY: Taylor & Francis.

Watson, L., Patten, E., Baranek, G., Poe, M., Boyd, B., Freuler, A., & Lorenzi, J. (2013). Differential associations between sensory response patterns and language, social, and communication measures in children with autism or other developmental disabilities. *Journal of Speech, Language, and Hearing Research, 54*(6), 1562-1576. doi:10.1044/1092-4388(2011/10-0029)

Webster, A., Cumming, J., & Rowland, S. (2017). *Empowering parents of children with autism spectrum disorder: Critical decision-making for quality outcomes.* Singapore: Springer.

Wei, R. C., Darling-Hammond, L., Andree, A., Richardson, N., Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad.* Dallas, TX: National Staff Development Council.

Whitebook, M., Sakai, L., Kipnis, F., Bellm, D., & Gromley, P. (2009). *Early education quality: Higher teacher qualifications for better learning environments – A review of the literature*. Berkeley, CA: Center for the Study of Child Care Employment, Institute for Research on Labor and Employment, University of California at Berkeley.

Wiley, S., Gustafson, S., & Rozniak, J. (2014). Needs of parents of children who are deaf/hard of hearing with autism spectrum disorder. *Journal of Deaf Studies and Deaf Education, 19*(1), 40-49.

Wouters, P., Van Nimwegen, C., Van Oostendorp, H., & Van Der Spek, E. D. (2013). A meta-analysis of the cognitive and motivational effects of serious games. *Journal of Educational Psychology, 105*(2), 249.

Yin, R. K. (2014). *Design and methods* (5th ed.). Los Angeles, CA: Sage Publications.

Yoo, J. (2016). The effect of professional development on teacher efficacy and teachers' self-analysis of their efficacy change. *Journal of Teacher Education for Sustainability*, 18(1), 84-94

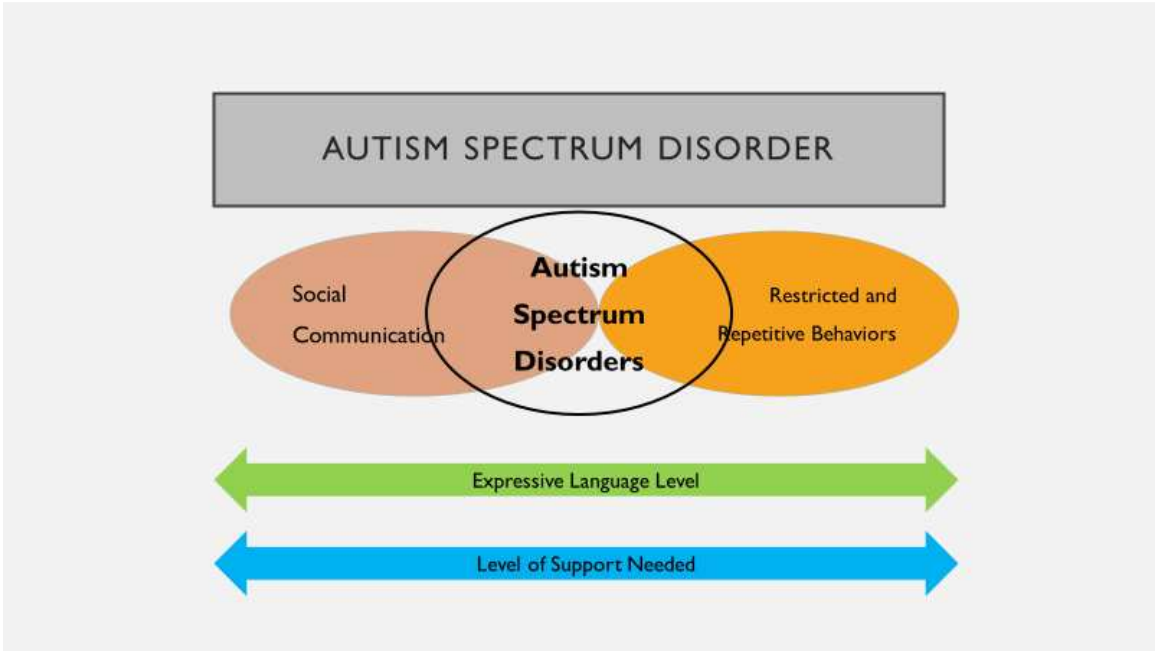
Zaider, T., Heimberg, R.G., Fresco D.M. (2015). Evaluation of the clinical global impression acale among individuals with social anxiety disorder. *Psychology Medical, 33*(4), 611–622.

Appendix A: The Project


3 DAY OVERVIEW PRESENTATION
Day 1- Autism Spectrum Disorder
What is Autism Spectrum Disorder?
History
Why Does it Matter?
Myths about Autism Spectrum Disorder
Current Research
Importance of Language and Social Behavior
Deficient in social-communication skills
Old Bridge
Day 2 – Music Therapy
What is Music Therapy?
Brain response
Music Intervention
Objectives
Misconceptions
Utilized in schools
Benefits
Current Research
Day 3 – Study, Results, and Impact
Research Question
Project Study
Literature Review
Sample Lesson
Data Collection/Results
Benefits of the Educational Enrichment Model of Music Therapy


DAY 1
"AUTISM IS NOT CONTAGIOUS, BUT MY SMILE IS."
-UNKNOWN
8:00 – 8:30 Check-in
8:30 – 9:00 Introductions and Overview
9:00 – 10:30 History of Autism Spectrum Disorder
10:30 – 10:45 Break
10:45 – 12:45 Myths about Autism Spectrum Disorder/Current Research
12:45 – 1:45 Lunch
1:45 – 2:30 Importance of Language and Social Behavior
Deficient in Social-Communication Skills
2:30 – 3:00 Questions/Concerns Wrap Up


WHAT IS AUTISM SPECTRUM DISORDER?
Autism Spectrum Disorder (ASD) is a disorder of brain development
Onset in childhood; continues into adulthood
Children and adults with ASD may communicate, interact, behave, and learn in ways that are different than most people
Two core areas of characteristics: 1) Impairments in social interaction and social communication 2) Restricted and repetitive patterns of behavior, interests or activities
Abilities of people with ASD can range from gifted to severely challenged


AUTISM SPECTRUM DISORDER
Social Communication
Autism Spectrum Disorders
Restricted and Repetitive Behaviors
Expressive Language Level
Level of Support Needed

CHILDREN WITH ASD MIGHT:

- Not point at objects to show interest
- Not look at objects when another person points at them
- Have trouble relating to others or not have an interest in other people at all
- Appear to be "in their own world"
- Avoid eye contact and want to be alone
- Have trouble understanding other people's feelings or talking about their own feelings

(Social Communication)

- Repeat actions over and over again
- Play with toys or objects non-functionally
- Have trouble adapting when a routine changes
- Have unusual reactions to the way things smell, taste, look, feel, or sound
- Have unusual motor movements

(Restricted & Repetitive Interests)

HOW COMMON IS ASD?

- 1 in 68 children has an autism spectrum disorder (CDC, 2014)
- More common in boys than girls
- ASD occurs in all racial, ethnic, and social groups…BUT
  - African American and Latino children are more likely to be diagnosed later

DISPARITIES IN DIAGNOSIS

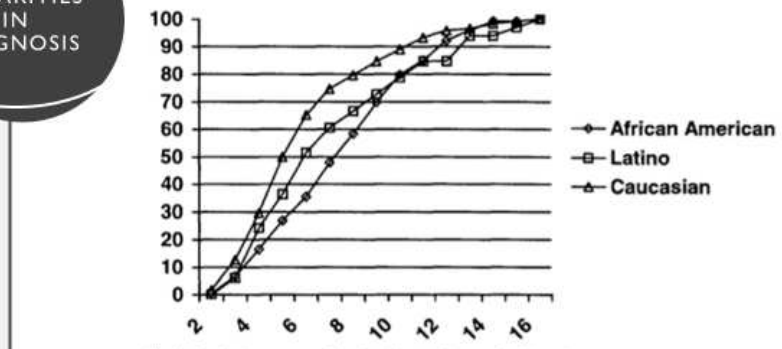
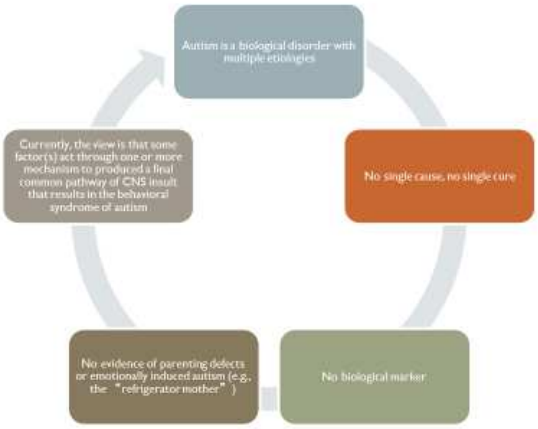


Fig. 1 Cumulative percentage of sample with autism by age at first diagnosis.

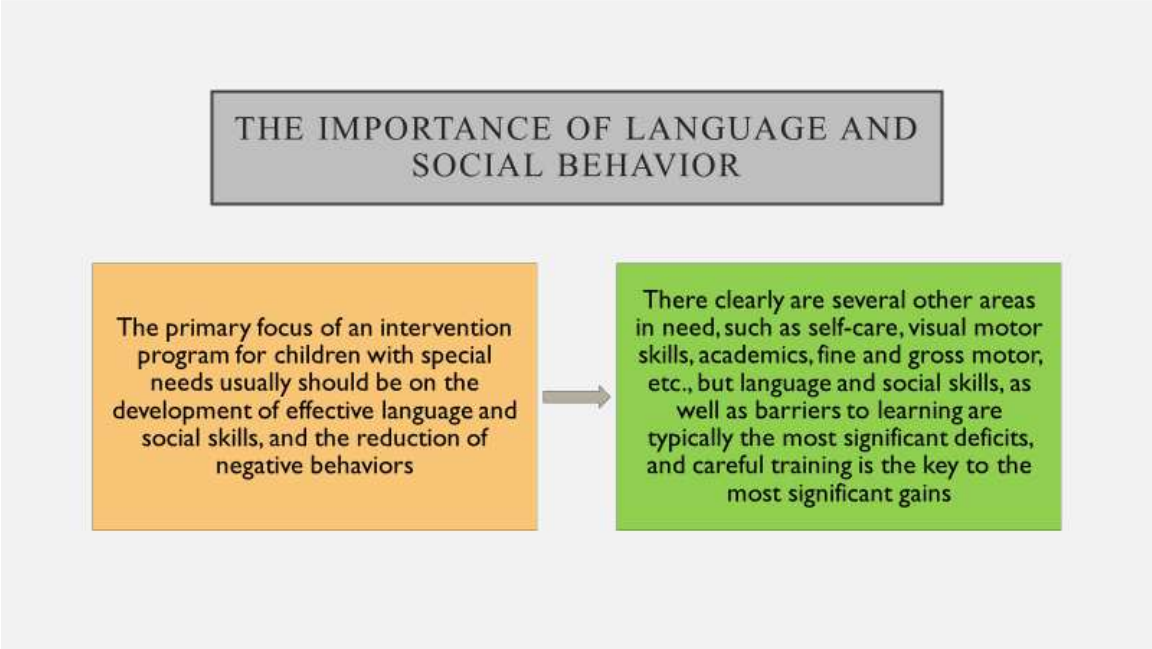
HISTORICAL MYTHS ABOUT AUTISM

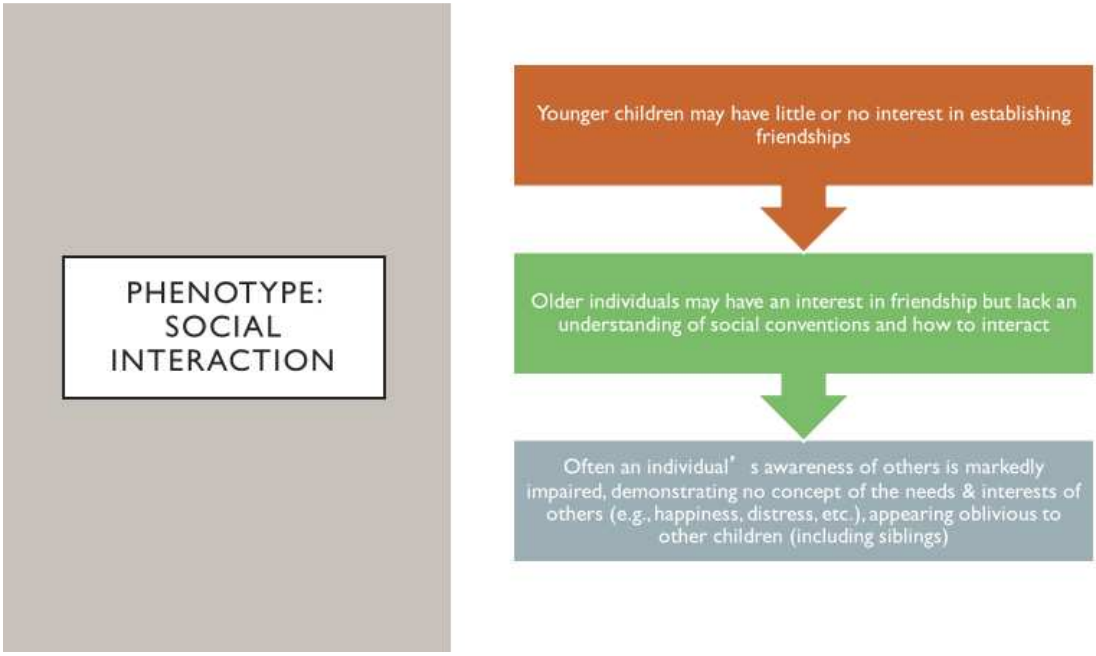


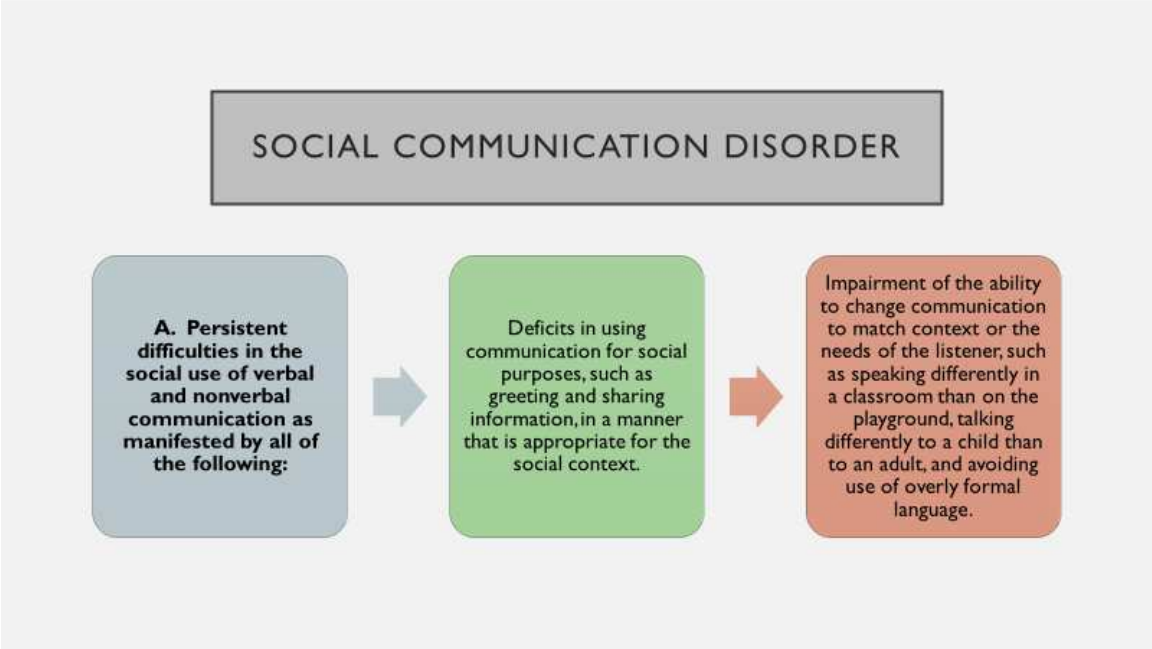
WHAT WE KNOW ABOUT AUTISM

CURRENT RESEARCH INTO ETIOLOGY

- Abnormalities in the genome
  - Chromosome 15q11-q13 is implicated based upon twin & family studies (re: PWS & Angelman)
- Mechanisms underlying the expression of these abnormalities during brain development
- Resulting structural and functional abnormalities in the brain
- Behavioral expressions of autism


THE IMPORTANCE OF LANGUAGE AND SOCIAL BEHAVIOR
The primary focus of an intervention program for children with special needs usually should be on the development of effective language and social skills, and the reduction of negative behaviors
There clearly are several other areas in need, such as self-care, visual motor skills, academics, fine and gross motor, etc., but language and social skills, as well as barriers to learning are typically the most significant deficits, and careful training is the key to the most significant gains


PHENOTYPE: SOCIAL INTERACTION
Younger children may have little or no interest in establishing friendships
Older individuals may have an interest in friendship but lack an understanding of social conventions and how to interact
Often an individual' s awareness of others is markedly impaired, demonstrating no concept of the needs & interests of others (e.g., happiness, distress, etc.), appearing oblivious to other children (including siblings)


SOCIAL COMMUNICATION DISORDER
A. Persistent difficulties in the social use of verbal and nonverbal communication as manifested by all of the following:
Deficits in using communication for social purposes, such as greeting and sharing information, in a manner that is appropriate for the social context.
Impairment of the ability to change communication to match context or the needs of the listener, such as speaking differently in a classroom than on the playground, talking differently to a child than to an adult, and avoiding use of overly formal language.


SOCIAL COMMUNICATION DISORDER (CONT.)
B. The deficits result in functional limitations in effective communication, social participation, social relationships, academic achievement, or occupational performance, individually or in combination.
C. The onset of the symptoms is in the early developmental period (but deficits may not become fully manifest until social communication demands exceed limited capacities).
D. The symptoms are not attributable to another medical or neurological condition or to low abilities in the domains or word structure and grammar, and are not better explained by autism spectrum disorder, intellectual disability (intellectual developmental disorder), global developmental delay, or another mental disorder.

SOCIAL COMMUNICATION DEFICITS

Social-emotional reciprocity	Nonverbal communication	Relationships
• Failure of back and forth conversation • Failure to initiate or respond to social interactions	• Abnormal eye contact and body language • Lack/limited (of) facial expressions or gestures	• Decreased interest in peers • Difficulties adjusting behavior to suit social contexts

SEVERITY LEVELS

Dimensional Ratings for DSM V ASD	Social Communication	Fixated Interests and Repetitive Behaviors
Level 3 Requires very substantial support	Severe deficits in verbal and nonverbal. Very limited initiation of social interactions and minimal response to overtures.	Inflexibility of behavior, extreme difficulty coping with change. RRBs that markedly interfere in all spheres. Great distress
Level 2 Requires substantial support	Marked deficits with limited initiations and reduced or atypical responses. Impairment apparent even with supports in place.	Inflexible in behavior, difficulty coping with change, frequent RRBs and interfere in a variety of contexts. Some distress.
Level 1 Requires support	With supports in place, noticeable impairments. Difficulty initiating social interactions and clear atypical responses. Maybe decrease social interest.	Behavioral inflexibility causes significant interference in one or more contexts. Trouble switching. Problems organizing and planning.

ADDRESSING SOCIAL SKILLS

- HAVE PROXIMITY TO PEERS
- SEE PEER MODELS OF SOCIAL SKILLS
- GIVE FEEDBACK TO CORRECT SOCIAL FAUX PAS
- STOP INTERACTIONS THAT ARE NOT GOING WELL

QUESTIONS AND CONCERNS

DAY 2

"IF THEY CAN'T LEARN THE WAY WE TEACH, WE TEACH THE WAY THEY LEARN"

-DR. O. IVAR LOVAAS

8:00 – 8:30	Check-in
8:30 – 10:30	Music Therapy
10:30 – 10:45	Break
10:45 – 12:45	Music Intervention (Objectives/Misconceptions)
12:45 – 1:45	Lunch
1:45 – 2:30	Music Intervention (Utilized in Schools/Benefits/Current Research)
2:30 – 3:00	Questions/Concerns Wrap Up

WHAT IS MUSIC THERAPY?

MUSIC THERAPY PROVIDES A UNIQUE VARIETY OF MUSIC EXPERIENCES IN AN INTENTIONAL AND DEVELOPMENTALLY APPROPRIATE MANNER TO EFFECT CHANGES IN BEHAVIOR AND FACILITATE DEVELOPMENT OF COMMUNICATION SKILLS.

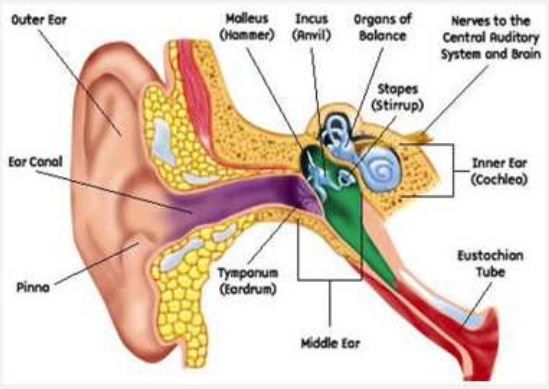
ASSESS STRENGTHS AND WEAKNESSES IN THE FOLLOWING AREAS: AFFECTIVE, EMOTIONAL AND BEHAVIORAL RESPONSES, SOCIAL FUNCTIONING, COMMUNICATION ABILITIES, AND COGNITIVE SKILLS

DESIGN MUSIC FOR ASD CHILDREN - PREFERRED MUSIC AND INTERVENTIONS LIKE: MUSIC IMPROVISATION, RECEPTIVE MUSIC LISTENING, MUSIC AND IMAGERY, MUSIC PERFORMANCE, AND LEARNING THROUGH MUSIC

MUSIC & IT'S EFFECT ON THE BRAIN

HOW YOU HEAR

- Sound enters ears and travels along your ear canal
- It sets off a wave of vibrations from your eardrum to the snail-shaped cochlea in your inner ear
- These vibrations stimulate sensory hair cells in your cochlea
- This generates a nerve impulse which travels along your cochlear nerve to your brain
- The temporal lobe processes the sound



BRAIN RESPONSE TO MUSIC

Right hemisphere of the brain

Activated when you *hear melodies with a variety of pitch and timbre*

It also "lights up" when people play music by ear.

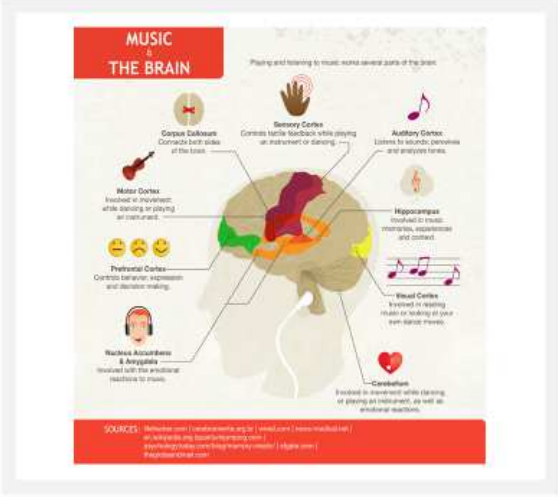
Left hemisphere of the brain

"Lights Up" when you learn to *read music, understand key signature and notation, and follow the sequence of notes.*

Significantly, the brain is activated in the same area that is involved in analytical and mathematical thinking.

So you can simultaneously stimulate the right and left hemispheres of the brain by playing an instrument or by singing

MUSIC AND THE BRAIN IN ASD CHILDREN



WHAT OBJECTIVES CAN MUSIC THERAPY ADDRESS?

Promote	Promote wellness
Express	Express feelings
Enhance	Enhance memory
Improve	Improve communication
Enhance/ improve	Enhance/improve socialization

MISCONCEPTIONS ABOUT MUSIC THERAPY TREATMENT

- Musical ability is required to benefit from music therapy
- Music therapy involves just listening to music.
- Certain types of music are more therapeutic than others.
  - All styles of music can be useful in effecting change in a client or patient's life.
  - Individual's preferences, circumstances and need for treatment, and the client or patient's goals help to determine the types of music a music therapist may use (AMTA, 1999)

WHAT POPULATIONS CAN BENEFIT FROM MUSIC THERAPY?

- Children, adolescents, adults, and the elderly with mental health needs
- Individuals with developmental and learning disabilities
- Individuals with brain injuries and physical disabilities

HOW IS MUSIC THERAPY UTILIZED IN SCHOOLS?

Music learning is used to strengthen nonmusical areas such as communication skills and physical coordination skills which are important for daily life.

Music Therapy (MT)

MT for Very Young Children

MT can be used to address:

- vocalization and speech and language goals through singing
- motor development through instrument play and rhythmic movement experiences

Sample goal & objective areas

The child will demonstrate improved language skills:

- ability to sing a 3-4 line song
- ability to verbally identify objects in a song

The child will demonstrate improved fine and/or gross motor skills:

- ability to strum guitar held by therapist
- ability to beat drum rhythmically

MT for Pre-school Children

MT can be used to:

- address understanding of syntax and grammar patterns in speech using melodic structure
- develop organizational capabilities with the use of melodic and rhythmic patterns
- develop communication and social skills

Sample goal & objective areas

The child will improve social skills:

- improve turn-taking
- use appropriate greeting
- improve ability to label & describe

The child will improve academic concepts:

- letter identification/sounds
- calendar concepts
- colors, shapes, sizes

The child will improve daily living & safety skills:

- hand washing
- manners
- phone number/address

MT for School Age Children

MT can be used to:

- Address higher level social and academic skills such as empathy, turn taking, compromise and problem solving skills in social situations.

Sample goal & objective areas

Improve academic understanding in mathematics:

- math facts
- telling time
- money concepts

Improve academic understanding in reading/writing:

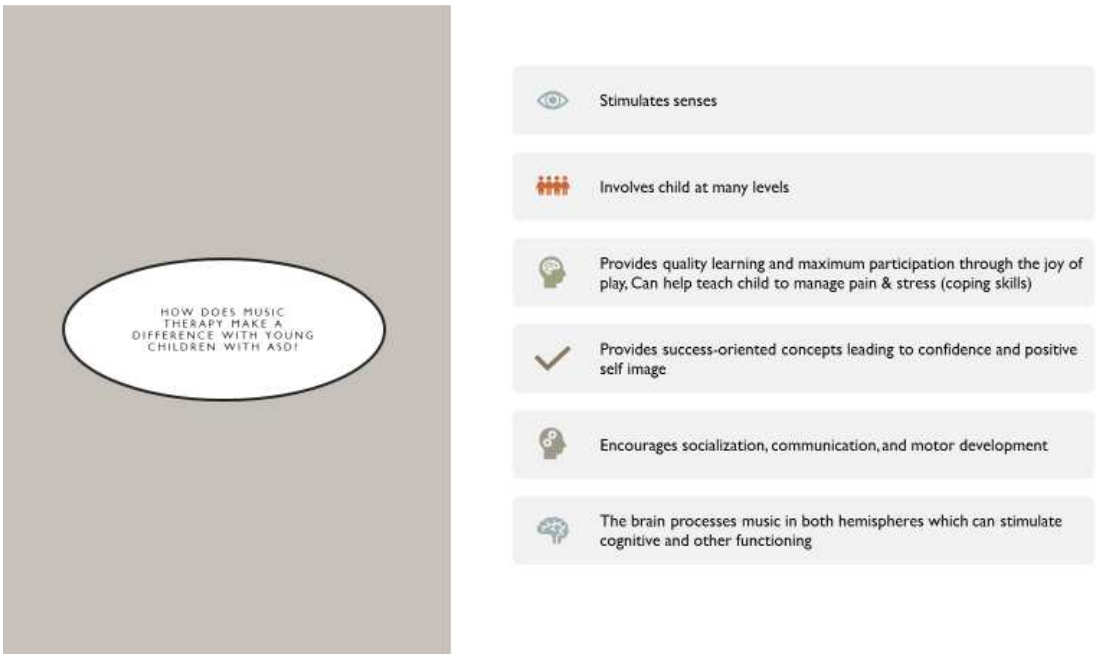
- phonics and sight words
- story elements

Improve behavior/well-being

- learn classroom rules
- improve attention & focus
- improve self-expression

Improve communication & social skills:

- "wh" (who, what, where, questions
- vocabulary development

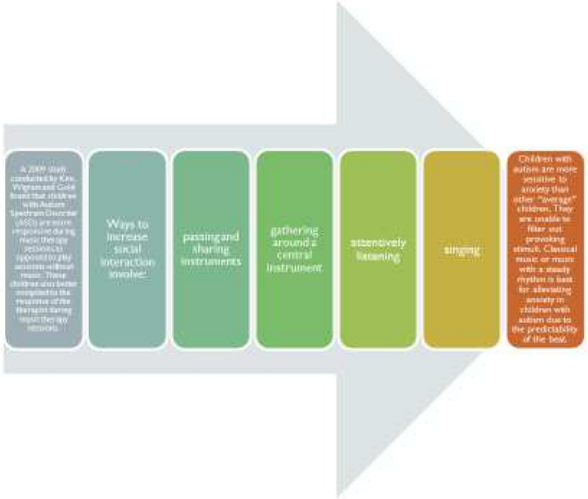

HOW DOES MUSIC THERAPY MAKE A DIFFERENCE WITH YOUNG CHILDREN WITH ASD!
Stimulates senses
Involves child at many levels
Provides quality learning and maximum participation through the joy of play. Can help teach child to manage pain & stress (coping skills)
Provides success-oriented concepts leading to confidence and positive self image
Encourages socialization, communication, and motor development
The brain processes music in both hemispheres which can stimulate cognitive and other functioning


MUSICAL MIRACLES? AID FOR AUTISM?
Usually, an autistic child has much trouble tying their shoes. However, with the aid of music, the child can achieve this goal faster! That's because there is a rhythm to coordinate the action to
Music with strong beats will cause the brain to resonate to the same rhythm
Slow beats help calm brainwaves (associated with hypnotic state)

WHAT MAKES MUSIC THERAPY A USEFUL MODE OF TREATMENT FOR CHILDREN WITH AUTISM?

- The Brains of children with Autism are essentially "wired differently," which often results in children who have difficulty processing the world around them at the same speed and clarity as other children their age.
- The inherent order of music maintains structure and thus, predictability, which is comforting to the child with Autism.
- Making music (or even listening to music) draws the brain's focus by stimulating all senses. It can also stimulate cognitive functioning and assist with remediation of speech skills as music is processed on both hemispheres of brain.
- Music is also a non-threatening and powerful motivator that can encourage socialization, self-expression, attention, communication, and motor development.

MUSIC CAN IMPROVE COMMUNICATION CURRENT RESEARCH…



QUESTIONS AND CONCERNS

DAY 3

"IT IS NEVER TO LATE TO EXPAND THE MIND OF A PERSON ON THE AUTISM SPECTRUM"

-DR. TEMPLE GRANDIN

8:00 – 8:30	Check-in
8:30 – 10:30	Video/Research Question/Project Study
10:30 – 10:45	Break
10:45 – 12:45	Data Collection/Results
12:45 – 1:45	Lunch
1:45 – 2:30	Benefits of the Educational Enrichment Model of Music Therapy
2:30 – 3:00	Questions/Concerns Wrap Up

NEW HOPE FOR AUTISM: MUSIC THERAPY FOR CHILDREN WITH AUTISM

- https://youtu.be/5PT9AYwpD3I

OLD BRIDGE STATISTICS

- Enrollment figures for autistic children in the district have increased over the past 4 years.
- Of the 1,393 students classified as special education students for the 2016-2017 school year, 135 of those were diagnosed with autism.
- This is a 44% increase from the 2013-2014 school year, when the district enrolled 76 autistic children.
- From 2014-2018, the number of autistic children enrolled in the district continued to increase.

RESEARCH QUESTION

Based upon the local problem, the purpose statement, and gaps in practice, the following quantitative research question is structured to investigate the effect of music therapy on ASD children related to their social-communicative

Research Question:

What is the difference in the change in communication skills, as measured by Observational Rating Scale of Social and Communication Skills for Children with Autism Checklist between those ASD students who participated in 9 weeks of music?

PROJECT STUDY *PURPOSE*

OLD BRIDGE TOWNSHIP OTPS OB PUBLIC SCHOOLS

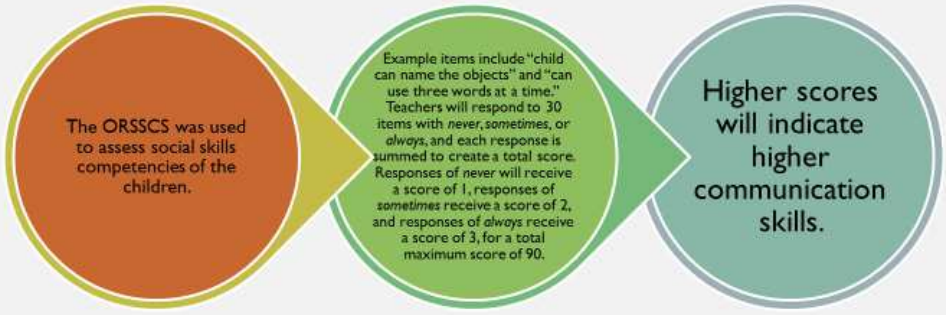
The district has 12 elementary schools in which there are eight self-contained classes of autistic children, five Applied Behavior Analysis (ABA) classes, and 15 Learning Language Disabled (LLD) classes. There are 28 elementary special education teachers of which eight teach students whom are classified as autistic.

The Director of Special Services implemented a music therapy program in a district building where I am not the principal. One of these two autistic classes will receive a treatment of music. This class has six students who received the district-mandated intervention.

PROJECT STUDY *INSTRUMENTATION AND MATERIALS*

- *Do-Watch-Listen-Say: Social and Communication Intervention for Children with Autism* by Kathleen Ann Quill (2000) and called the revised instrument the ORSSCS.
- This is an observational rating form for communication skills and was designed for practitioners and researchers to assess the communicative competence of ASD individuals.

ORSSCS
OBSERVATIONAL RATING SCALE OF SOCIAL AND COMMUNICATION SKILLS



01

To better understand what the special education teachers will be looking for and reporting on, the following describes the music therapy intervention.

02

A music teacher conducted nine weekly music therapy sessions with the experimental group as per the directive of the Director of Special Services.

03

These music therapy sessions occurred during the students' normal music instruction.

04

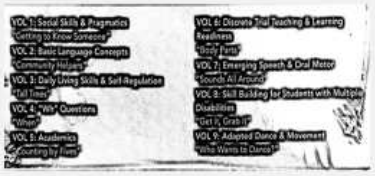
For three weeks prior to the implementation and during the 9-week implementation, the special education teachers noted each behavior on the ORSSCS.

MUSIC THERAPY INTERVENTION

MUSIC THERAPY INTERVENTION

In the music therapy interventions, musical instruments were available, including a full-size guitar, a small children's play guitar, maracas, jingle bells, hand drums, wood blocks, and tambourines.

- The music teacher used a CD player to play a *Tuned in to Learning* CD with specific pre-recorded songs for the music therapy sessions, a full list of which is in Appendix D.



SAMPLE LESSON PLAN

Appendix E: Music Therapy Lesson Plan

Population: ASD Children **Format:** 43 minute group session

I. Opening

a. Hello, Getting to Know You
   i. One at a time, each student ask one another student "How are you today" through the lyrics of this song.

II. Movement

a. You Gotta Sing When Your Spirit Says Sing
   i. Each student is given to a turn suggest a movement for the entire group to do as they sing this song.

III. Guided Instrumental Activities

a. Pass It Along and Can You Find a Friend?
   i. Each student will find a friend who had the instrument named in the song and ask that friend to share their instrument.

IV. Singing

a. Rules of Conversation
   i. Social skills and pragmatics
b. Expression on my Face
   i. Non-verbal Response
c. Look Over Here
   i. Imitation and Listening Response

V. Closing

a. It's Your Solo
   i. All students clap hands to the beat as one student at a time is called to take a dancing or rhythmic solo.

DATA COLLECTION

The students received music therapy as part of their weekly music lessons delivered by the music teacher.

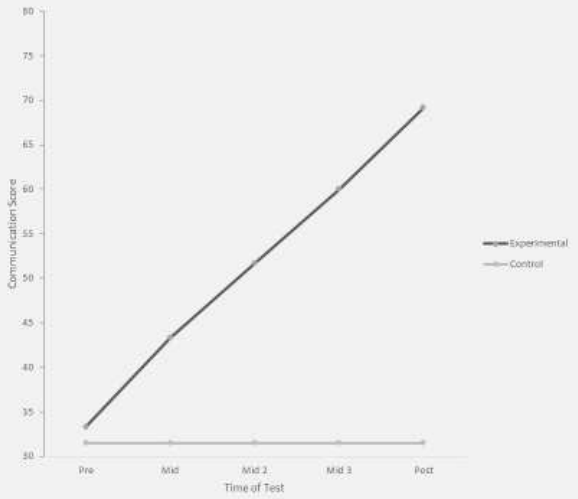
At the beginning of the 9-week intervention, the special education teacher of the students assessed the students.

During the 9 weeks of music therapy, the special education teachers used the instrument to assess behaviors at least three times.

At the conclusion of the 9 weeks of music therapy, the special education teachers once again used the instrument, this time as a posttest.

RESULTS

- The control group had relatively low scores that remained stable throughout the study period.
- In the experimental group, however, each student showed improvement in communication scores at each testing point.



BENEFITS OF THE EDUCATIONAL ENRICHMENT MODEL OF MUSIC THERAPY

- The amount of time and resources used to assess and serve one or two students could just as effectively be used to serve the whole classroom. The cost is then spread across a larger number of students. Music therapy is a wonderful way to encourage development and learning in infants and toddlers. Music stimulates all of the senses and involves the child at many levels. Quality learning and participation occur because music is highly motivating.
- Teachers gain skills that they can use on a regular basis to effectively and consistently intervene with students. The abilities of the teachers and other staff personnel are strengthened and enhanced.
- ASD students can work on such domains as "Social Skills" which can be effectively learned in a small group setting.


QUESTIONS AND
CONCERNS

PROFESSIONAL DEVELOPMENT EVALUATION CHECKLIST

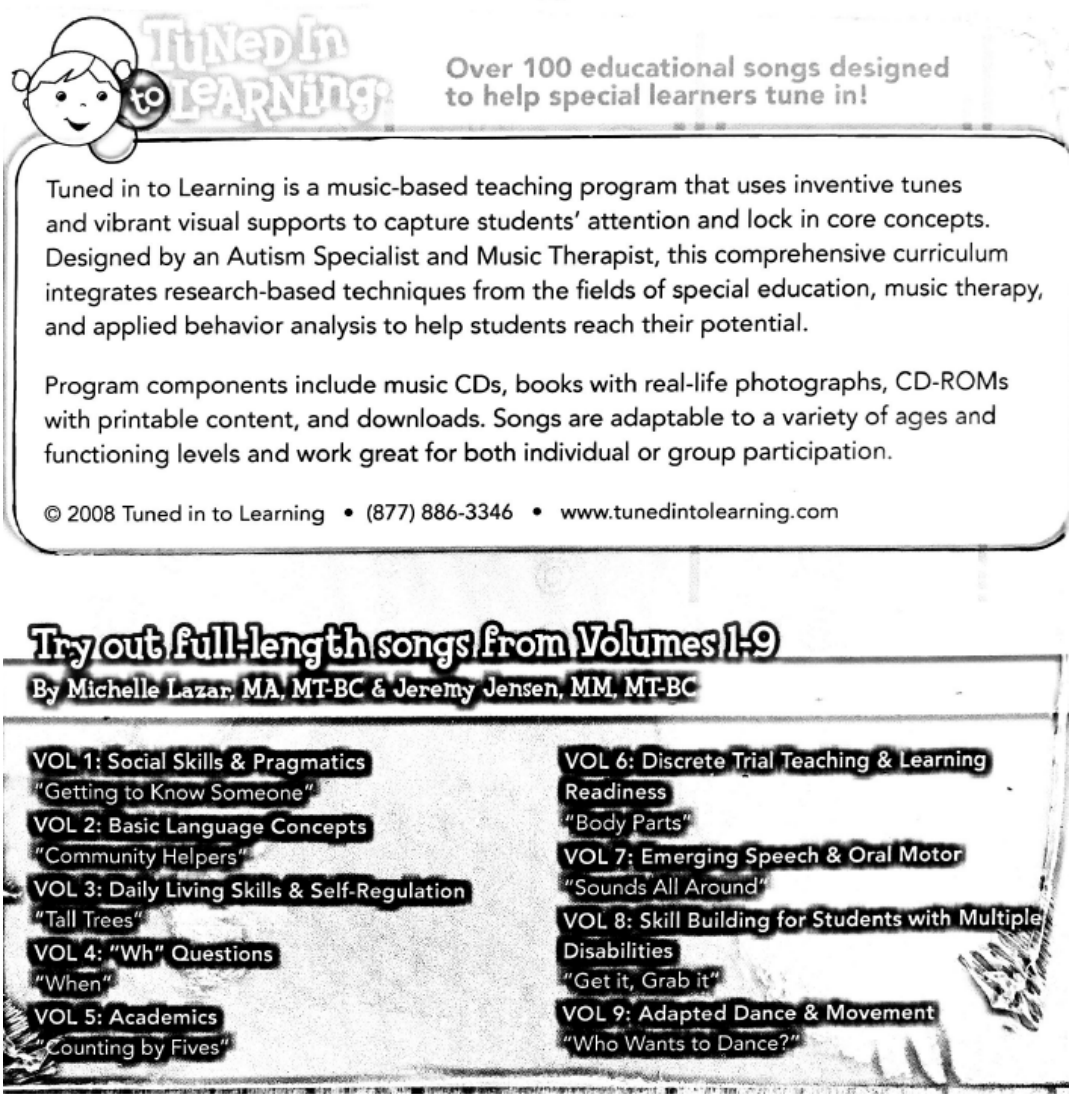
School: _____ Topic: _____ Date: _____	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
Content					
1. The objectives for today's session were clearly stated.	☐	☐	☐	☐	☐
2. Today's session was aligned to its stated objectives.	☐	☐	☐	☐	☐
3. Today's session was useful and practical.	☐	☐	☐	☐	☐
4. Today's session advanced the development of my leadership capacity.	☐	☐	☐	☐	☐
Process					
5. Today's activities (presentations, scenarios, group exercises, etc.) increased my capacity to use data to improve my practice.	☐	☐	☐	☐	☐
6. The facilitators of today's session effectively modeled appropriate instructional strategies.	☐	☐	☐	☐	☐
7. The facilitators of today's session incorporated our experiences into today's activities (presentations, scenarios, group exercises, etc.)	☐	☐	☐	☐	☐
8. Time was allocated effectively today to deepen my understanding of the presented material.	☐	☐	☐	☐	☐
Context					
9. There were opportunities during today's session to collaborate on shared activities.	☐	☐	☐	☐	☐
10. Today's activities (presentations, scenarios, group exercises, etc.) were relevant for my job-related needs.	☐	☐	☐	☐	☐
11. Today's sessions advanced my understanding of how to engage in a continuous improvement cycle.	☐	☐	☐	☐	☐
12. The organization of the learning environment (facilities, tools, materials, participant groupings, etc.) met my learning needs.	☐	☐	☐	☐	☐

Comments

Appendix B: Timeline of Procedures and Music Therapy Program

Month	Week		
1	1	Complete ASSCM	Complete ASSCM (pretest)
	2	45 Minute Music Therapy Class	Regular Class
	3	45 Minute Music Therapy Class	Regular Class
	4	Complete ASSCM	Complete ASSCM
2	5	Complete ASSCM	Complete ASSCM
	6	Complete ASSCM	Complete ASSCM
	7	45 Minute Music Therapy Class	Regular Class
	8	45 Minute Music Therapy Class	Regular Class
3	9	Complete ASSCM	Complete ASSCM (posttest)

Appendix C: List of Music Therapy Songs



Appendix D: Music Therapy Lesson Plan

Population: ASD Children **Format:** 43-minute group session

I. Opening

- a. Hello, Getting to Know You
  - i. One at a time, each student asks one another student "How are you today" through the lyrics of this song.

II. Movement

- a. You Gotta Sing When Your Spirit Says Sing
  - i. Each student is given to a turn suggest a movement for the entire group to do as they sing this song.

III. Guided Instrumental Activities

- a. Pass It Along and Can You Find a Friend?
  - i. Each student will find a friend who had the instrument named in the song and ask that friend to share their instrument.

IV. Singing

- a. Rules of Conversation
  - i. Social skills and pragmatics
- b. Expression on my Face
  - i. Non-verbal Response
- c. Look Over Here
  - i. Imitation and Listening Response

V. Closing

- a. It's Your Solo
  - i. All students clap hands to the beat as one student at a time is called to take a dancing or rhythmic solo.

Appendix E: Approval Letter

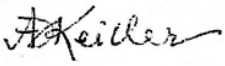
June 14, 2017

To Whom It May Concern:

Mr. Raymond Payton will be conducting his research study on music therapy effects on social-communicative response of children with autism spectrum disorder (ASD).

As the Director of Arts & Cultures, I am writing to confirm that the music teacher will be doing the intervention as part of his/her daily instruction, not part of his study.

Respectfully,



Anahita Keiller
Director of Arts & Cultures

Appendix F: Director of Special Services Approval Letter

October 2018

Dear Walden University IRB,

The purpose of this letter is to grant Raymond Payton permission to grant access to secondary data related to his research study. The project titled, "Music Therapy Effects on Social-Communicative Response of Children with Autism Spectrum Disorder" entails investigating the difference in the change in social - communication skills, as measured by the Assessment of Social Skills for Children with Autism between those ASD students who participated in 9 weeks of music therapy and those who did not.

I understand that Raymond Payton will get de-identified data from two of our special education teachers over the next 9 weeks. As the Director of Special Services, I can confirm that we are happy to participate in this study and contribute to this most important research.

Sincerely,

Dr. James Tuohy

Appendix G: Authorization to use the Assessment of Social Skills for Children with Autism

Re: Need your assistance for Ed.D. dissertation

Kathleen Quill <kquill@autisminstitute.net>

Tue 8/21/2018 7:48 AM

To: Raymond Payton <raymond.payton@waldenu.edu>;

Good morning Ray,
Congratulations on your project, and thank you for contacting me. The assessment tool in DWLS is not standardized and it is intended to be used flexibly. You are welcome to use any parts of the tool for your study. Minor additions to the content would need to be highlighted and footnoted. However, any changes to the content cannot occur. Instead, I would suggest that you develop an addendum section to the tool that addresses your focus. As always, please discuss with your team of advisors. They are welcome to contact me, as well.
Best,

Kathleen A. Quill, Ed.D., BCBA-D
Autism Institute
PO Box 190
Essex, MA 01929 USA
mobile 978-500-4585
kquill@autisminstitute.net

Appendix H: Walden Institutional Review Board Approval Number

The Walden University Institutional Review Board approval number was 10-15-18-0536403.