EXPLORING THE IMPACT OF MUSIC THERAPY ON CHILDREN WITH
COMPLEX COMMUNICATION NEEDS AND AUTISM SPECTRUM
DISORDERS: A FOCUS GROUP STUDY

A Thesis

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Abstract

Purpose

The purpose of this study was to explore the benefits and challenges of using music to help children with ASD meet their communication goals. Also, roles that augmentative and alternative communication systems have played in Music Therapy were discussed. Finally, information was gathered in order to help Speech-Language Pathologists incorporate music into therapeutic sessions as well as to help make collaboration easier between Speech-Language Pathologists and Music Therapists.

Methods

Ten Music Therapists, who had been Board Certified for at least 5 years, were currently working with a non-speaking child with an Autism Spectrum Disorder (ASD), and had a high self-rank skill of using Augmentative and Alternative Communication (AAC) participated in an online focus group. Over six weeks, participants discussed topics including the impact of Music Therapy on children with complex communication needs and ASD as well as advice for Speech-Language Pathologists.

Results

Thematic analysis revealed seventeen different themes that fell into 5 different categories. These categories included benefits, challenges, roles AAC play, advice, and other. The results of this study focused around the benefits and challenges of
using music with children with complex communication needs, the roles AAC plays in therapy sessions, and advice Music Therapists have for Speech-Language Pathologists. Under these four categories, there were seventeen themes, which include: Motivation and Reinforcement, Total Improvement, Neurological, Motor, Life and Social Skills, Capturing the Benefits, Learned Behavior vs. Communication, Generalization, Dividing Attention Between AAC and Music, Serves as an Individual’s Voice, Provides Control, Provides Choices, Keep It Simple, Collaborate Effectively with a Music Therapist, Be Confident, Not Self-Conscious, Maintain Appropriate Expectations and Considerations, Use Resources, and Other.

Conclusion

Motivation and reinforcement, along with neurology seem to have a big part in the benefits of Music Therapy on communication skills and non-communication skills of children with complex communication needs and ASD. This study lays foundation for future studies that need to be done in order to validate these ideas. Also, Speech-Language Pathologists can use information provided by this study to help them incorporate music into their therapeutic sessions as well as to justify collaboration between themselves and Music Therapists in order to give clients the best care possible.
Introduction

What are Autism Spectrum Disorders?

One in 68 American children are identified on the autism spectrum according to a recent study done by the U.S. Centers for Disease Control and Prevention (CDC), which is significantly higher than the results found in 2007. (Blumberg, S. J., Bramlett, M. D., Kogan, M. D., Schieve, L. A., Jones, J. R., & and Lu, M. C., 2013). This is a ten-fold increase in the last 40 years. Along with this staggering statistic, the number of children diagnosed each year with an autism spectrum disorder (ASD) outweighs the number of children diagnosed with juvenile diabetes, AIDS, or cancer combined (“What is Autism,” 2013). This leads to a very important question: What exactly is ASD? ASD affects the brain and has many symptoms. These include “communication delays, repeating words or phrases, unresponsiveness to verbal cues, social difficulties, oversensitivity (sound, light, etc.), resistance to change, lack of direct eye contact, odd or unusual repetitive play, and self-stimulation” (Hourigan, R. and Hourigan, A., 2009, p. 40). One of the main areas in which children with ASD struggle is communication. Silverman (2008) explains, “People with autism often have difficulty communicating, primarily because of the tendency for obsessive focus and not being able to understand subtle verbal and nonverbal cues. In fact, one of the first indicators of autism is difficulty in communication” (p. 9).

ASDs are composed of several different conditions that include Asperger syndrome, autistic disorder, and pervasive developmental disorder not otherwise
specified (PDD-NOS). These three disorders differ in the variety and severity of impairments in areas such as communication and social interaction. Children who have Asperger’s Disorder are able to communicate and do not have major deficits in language or cognitive abilities, but they still have problems in social situations. These children are considered on the high functioning end of the Autism Spectrum. Children who are considered “low functioning” have more severe impairments, which might include intellectual disabilities or severe deficits in language and communication as well as social interaction. PDD-NOS, on the other hand, is used to describe a child who has behaviors or certain deficits on the spectrum but does not fall into a certain category, such as Autism or Asperger’s, because he or she doesn’t meet the specific criteria (“Autistic Disorder and Asperger’s Disorder (Pervasive Developmental Disorders): Questions & Answers,” 2014). In the most current guidelines for the Diagnostic Statistic Manual (DSM), PDD-NOS and Asperger’s Disorder are now considered part of the Autism Spectrum rather than being separate diagnostic categories.

According to the CDC, ASD begins early in a child’s life and lasts his or her entire lifetime. The time it takes for parents to realize that their child might have ASD can vary, however. The CDC explains this through the following statistics:

Some children with an ASD seem to develop normally until around 18 to 24 months of age and then they stop gaining new skills, or they lose the skills they once had. Studies have shown that one third to half of parents of children with an ASD noticed a problem before their child’s first birthday, and nearly 80%–90% saw problems by 24 months of age. (“Signs and Symptoms,” 2014)
Symptoms of ASDs can improve over time, however. The earlier that a child is diagnosed and starts receiving treatment means that there is a better chance for improvement. Also, treatments and interventions can help these children learn skills that they are lacking.

While there is much still unknown about ASD, there are a few things that are known. ASD is much more common in boys than girls, usually three to four times more. ASD affects children from all cultures and ethnic groups, as well as all socioeconomic groups. Also, early intervention can improve behaviors and children’s abilities. The cause, or causes, of ASD, however, is still undetermined. It is believed, with the research that has already been done, that DNA changes might cause ASD, but research is still ongoing (“Autism Spectrum Disorders,” 2010). One main thing that is known, however, is that the brain of children with ASD differs from the brain of normally developing children (Shriber, 2010).

**ASD and Neurology**

Due to the advancement in technology, examinations like MRIs and PET scans have been done in order to show that the brains of children with ASD have key differences from those of children without disabilities, in their structure and function. The brains of children with ASD are larger, as shown in a study by Redcay and Courchesne (2005) that revealed that the brain/head size is 10% greater by one year of age in children with ASD over the control group. This is thought to be due to an
additional amount of neurons. Also, it has been shown that brainstems of children with ASD are smaller (Hashimoto, Tayama, Murakawa, and Kuroda, 1995) with a potentially related increase in the time it takes information to transmit into their brainstems (Akshoomoof, Pierce, and Courchesne, 2002). Along with this, the cerebellum, cerebrum, and cerebral cortex have all been shown to have differences. 

In a typically developing brain, the cerebellum is where sensory and motor activity is integrated and controlled. This is one area that has been shown to be comprised of excess neurons in the brain of those with ASD, with these neurons being distributed abnormally (Brambilla, Harden, diNemi, Perez, Soares, and Barale, 2003). It has also been shown that links between the cerebellum and other structures are decreased (Shriber, 2010). Along with this, Purkinje cells, which are responsible for arousing the reticular nuclei in order to help a person change what they are focusing on, have been shown to be in fewer quantity in the brain of an individual with an ASD (Rapin, 1998). When it comes to the cerebrum, the hippocampus, which lies within the cerebrum and helps with remembering new information, is larger in children with ASD (Brambilla, et al., 2003). Also, the amygdala, which also is in the cerebrum and is in charge of emotional responses and helping us determine which situations are threatening, can be enlarged as well (Howard, Cowell, Boucher, Broks, Mayes, and Farrant, 2000).

The corpus colossum, which delineates the middle of the brain and links both the right and left side together so they can communicate, is smaller in children with
ASD (Harden, Minshew, Mallidarjuhn, and Keshavan, 2000). This can potentially lead to a poor connection between the two sides as well as making the neuro-activity erratic. Along with this, in the four lobes (frontal, parietal, occipital, and temporal) of the cerebral cortex, the frontal lobe is larger. The larger size has been proposed to be related specifically to an increased number of axons (the connecting portions of neural cells) (Carper, Moses, Tigue, and Courchesne, 2002). Even though this is the case, however, the connections between these axons and ones in the parietal lobe are interrupted as well as ones between the parietal and frontal lobes and the ones in the thalamus.

These numerous amounts of axons may lead to problems with connections between structures, and there are also severe problems with connecting all parts of the brain together. This leads to a lack of communication and coordination between brain regions which can impact function, such as planning and organizing or coordinating movements (Shriber, 2010). ASD is still considered incurable, but there are many different approaches to help improve these symptoms, especially communication skills in children. Therapies shown to be helpful include Behavior Modification through Applied Behavior Analysis and Speech-Language Pathology. Pharmacological interventions appear to help with some symptoms. There are a range of alternative therapies espoused through different formal and informal distribution networks. Music therapy is an approach with a scientifically-based set of evidence behind it, and has been shown to be effective for individuals with a range of ASDs.
Music and Neurology

In general, connections between brain cells and areas of the brain become stronger if used and weaker if not used. By having strong connections, information can be exchanged more quickly throughout the brain which can improve a number of functions, including memory, sensory, movement, and feedback. There are different suggested mechanisms to strengthen connections. One approach is to note times that multiple regions are active during a single task. It has been shown through brain scans that almost the entire cerebral cortex of musicians is active during musical performances (Weinberger, 1998). During this performance, every part of the brain is working together at the same time. This activity is suggested to not only be symptomatic of musical activity, but also to be a vehicle to strengthen neural connections. In order to develop this benefit of music, Music Therapists are employed.

Music Therapy

According to the American Music Therapy Association (2014), Music Therapy is, “the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved Music Therapy program.” Music Therapy is when music is used to address emotional, cognitive, and social needs of individuals. After assessment of the client, the Music Therapist provides treatment that incorporates music such as singing, dancing, or listening to music. It is important to note that the Music Therapist does not write communication goals, but rather takes the goals
created by other rehabilitation professionals, such as Speech-Language Pathologists, and finds ways to meet those goals through music. By using music, the client strengthens his or her abilities and then generalizes these new learned skills into the other areas of their lives. Also, Music Therapy provides an outlet for communication for those who otherwise find it difficult to communicate. Below are some images that depict Music Therapists using musical interventions with children.
Type of Music Therapy Used

Many of the studies reviewed for the current study involve improvisational Music Therapy (ITM) because IMT is known for:

- its efficacy in engaging autistic children at their level and interest, and helping them to develop spontaneous self-expression, emotional communication and social interaction. Music offers a means of self-expression, communication and interaction that can be more easily assimilated by the children than some other medium (Kim, Wigram, Gold, 2008, p. 1758).

IMT often uses “musical attunement” which is the process of the therapist matching his or her client’s musical and non-musical expressions. Musical attunement is using improvised music to match a child’s pulse, movement, or expression in order to create a musical connection and therapeutic relationship between the child and the therapist by creating music that the child can relate to (Kim, Wigram, and Gold, 2008). Many of the studies involving IMT have happened in the past 30 years. Opportunities for Music Therapy and research about its effectiveness rose because of legislation changes related to school based service delivery for children with Autism. (Reschke-Hernandez, 2011).

Augmentative and Alternative Communication

Many of the studies done on music and the effect it has on ASDs focused on communication skills, both verbal and nonverbal. Silverman (2008) described nonverbal communication as communication that “can occur through nonlinguistic means, such as gestures, facial expressions, eye contact, pupil dilation, distance, attire, vocal features, movements, posturing, smell, and use of space” (p. 4) Attending to
nonverbal signals as communicative is part of a consideration of augmentative and alternative communication.

AAC is a set of strategies encompassing all of the potential, multimodal forms of communication beyond natural speech. There are over 3.5 million Americans whose speech is inadequate to meet the daily communication needs (Beukelman and Mirenda, 2013). These individuals can benefit from AAC strategies. Unaided strategies are those that do not require any external equipment and can be things like manual signs or gestures. Aided strategies do require external equipment and include things like picture boards or an iPad with an installed AAC program. It is estimated that about 50% of children with ASD will require AAC strategies (Lord, Risi, and Pickles, 2013).

Targeted behavior outcomes in individuals with ASD were positively affected by aided AAC interventions, especially communication skills (Ganz, J. B., Earles-Vollrath, T., Heath, A. K., Parker, R. I., Rispoli, M. J., & Duran, J. B., 2012, p. 60). However, in a study done by Gadberry (2011), it was found that only 14.6% of the Music Therapists that responded use AAC systems with clients who use these systems outside of therapy as well as that only 40% of these Music Therapists have had training in aided AAC. A survey by McCarthy, Geist, Zojwala, and Schock (2008) found that the majority of Music Therapists reported needing more training in AAC systems.
Two studies specifically looked at the effects of music on nonverbal communication in children with ASD. These studies did not focus on the use of aided AAC. In Gattino, Longo, Leite, Faccini, and Riesgo (2011), 12 male children with ASD participated in 16 weeks of both Music Therapy and clinical routine activities while 12 other male children participated in 16 weeks of clinical routine activities. At the end of the study, there was a statistically significant difference in the nonverbal communication of the children with ASD as determined by analysis of video recording that showed how often negative and positive behaviors occurred. This study did not offer any reason as to why music might have had this beneficial effect of the communication skills in children with ASD.

A study done by Kim, Wigram, and Gold (2008) found similar results, but their method was different than Gattino et al.’s. Kim et al.’s study focused solely on Music Therapy and its effects on joint attention in children with ASD. Joint attention is when two individuals focus their attention on one object at the same time. Through their study, Kim et al. wanted to see if there was any difference in joint attention in free play time versus Improvisational Music Therapy. They had ten participants with ASD aged 3 to 5 and went through both of the trials with half having play sessions first and then Music Therapy sessions and half having the opposite. These sessions occurred for 30 minutes once a week for 12 weeks. The results showed that Improvisational Music Therapy was associated with more joint attention than the play sessions with toys (Kim et al., 2008). This study also did not offer any reason for why music might have had the effect that was found. Both of these studies showed that an
improvement can be found in nonverbal communication through the use of Music Therapy. The two studies can be compared and contrasted when looking at their method and results. Both studies had a limited number of participants and both took place over a period of weeks. Also, due to schedules, both studies were not done every week. The two studies differed, however, in the way that the results were measured. While Gattino’s results were conducted by blind investigators, Kim’s results were conducted by both the children’s parents and professionals who worked with the children, such as therapists or teachers. Both studies did, however, show that Music Therapy did have a positive effect on the nonverbal communication skills of children with ASD as well as offered no reason for why music might have had the impact that was seen in the results.

**Verbal Communication**

Two Music Therapy studies focused less on the nonverbal communication and more on verbal communication with children with ASD. Lim (2010) had 50 children and broke them up into three separate groups. One group watched a video where a person sang lyrics that ended with one of the 36 target words and presented an image with each word. Another group watched a video where the person said the same lyrics and presented the same images. The third group watched no video. The videos were watched by the first two groups two times a day for three days. Then each child from each group took a test where they heard the lyric and had to provide the last target word. The results from this study showed that both the speech and musical methods helped improve communication, specifically in improving the acquisition of functional
vocabulary as well as enhancing speech production such as semantics and phonology, but music was the only method that greatly improved communication skills in children with both high and low levels of functioning. As Lim (2010) stated, “Music training might be an effective training tool for children with either a high or a low level of functioning” (p. 20). This study did not, however, provide any reason for why music might have had this beneficial impact.

Edgerton (1994) conducted a study that suggested music helps verbal communication in children with ASD. In this study, she had 11 children participate in a 30 minute session once a week in which they had Improvisational Music Therapy. During the sixth week, instead of improvised music, the therapist withdrew the intervention to see the effect. After this week, all of the children continued Improvisational Music Therapy for the following four weeks. The results showed that the Music Therapy helped the children’s communication, and also showed that each child’s communication skills returned to levels before the intervention during the week that they did not have the therapy. The significant correlation between the musical vocal behavior gains and the nonmusical speech production gains indicated that, as musical vocal behaviors increased, nonmusical speech production behaviors also increased on the average. Edgerton’s study did not, however, offer any reasoning for why music might have had the impact that was found. Again, both of these studies showed that music could impact communication skills in children with ASD. These two studies can also be compared and contrasted using their method and results. Again, both studies had fairly small sample sizes, although Lim’s (2010) study did
have more children than any other study. Lim’s study broke from the traditional mold in that rather than conducting research over a period of weeks, his study occurred over a period of three days. Lim’s results came from an actual test that was given to the children while Edgerton’s results came from watching the interaction and communication from the children. Although the two studies differed greatly, they both provided evidence that music did help improve communication skills in children with autism. Also, neither study looked at or discussed why music might have had this beneficial effect.

While all of the studies showed that music did help improve communication skills in children with ASD, more research is clearly needed in order to help understand in what ways it is helpful. There is research that shows music interventions could be beneficial to children with autism for both non-communication and communication skills, but further research needs to be conducted in order to validate the use of these interventions in terms of their ability to teach skills that will be maintained and generalized (Simpson and Keen, 2011, p. 1513).

**Conclusion**

Music is certainly associated with changes in communication skills, but the reasons for this are not clear. Such information is important so that musical interventions can be optimized. Long term effects and follow-up are also important considerations to help demonstrate a therapeutic effect for music. None of the studies
noted had any long term component. Exploration of mechanisms of effects and their effectiveness is warranted.

Researchers have offered several explanations, mostly opinions, about why music in general may help children with ASD communicate, although there has been little research or evidence obtained to support these claims as previously shown. Music has been described as a form of outlet or a way for children to express themselves. Reschke-Hernandez (2011) explains, “Children with autism experienced music as a nonthreatening medium and therefore were more likely to become engaged in a musical experience than in other environments, particularly in child-directed improvised music” (p. 173). But due to the lack of research, it cannot be definitively stated as to why music has such a beneficial impact on the communication skills of children with ASD, but merely guessed at or assumed. Evidence-based practice (EBP) requires rigorous analysis of available research in selecting treatments. EBP also recognizes the value of clinical opinion though. In exploring potential future research avenues, it is often instructive to start by querying professions about their priorities and opinions. This study conducted a focus group of Music Therapists who work with non-speaking children with ASD so that information could be collected to help determine why music might have this beneficial impact on the communication skills of those children. Also, along with providing information in this area that greatly lacks any research, the focus group was used to gather information to help Speech-Language Pathologists incorporate music into therapeutic sessions, to uncover the benefits and challenges of using music with children with ASD, and to provide more knowledge on
music therapists’ skills with AAC devices. All of this information helps make it easier for Music Therapists and Speech-Language Pathologists to collaborate as well as provide reasoning for why music should be used in therapy to help alleviate the symptoms of ASD in children, especially for communication purposes.

The current study considered the following research questions:

1. What are the benefits and challenges of using music to help non-speaking children with ASD meet their communication goals?

2. What are the roles that augmentative and alternative communication (AAC) systems have played in Music Therapy?

3. What advice can be given to speech-language pathologists to help them incorporate music into therapeutic sessions?
Method

Research Design

This qualitative study involved an online focus group discussion. A focus group is described by Eliot & Associates (2005) as:

A focus group is a small group of six to ten people led through an open discussion by a skilled moderator. The group needs to be large enough to generate rich discussion but not so large that some participants are left out. Focus groups are structured around a set of carefully predetermined questions – usually no more than 10 – but the discussion is free-flowing. Ideally, participant comments will stimulate and influence the thinking and sharing of others. Some people even find themselves changing their thoughts and opinions during the group.

This Internet forum methodology was determined to be the most appropriate design because it allowed the participants to contribute to the topic of discussion at their convenience and allowed for recruitment of top Music Therapists across the country. One question was posted each week and the participants were able to see the question along with the responses of the other participants in order to stimulate conversation. Participants were able to offer as many responses to the question and others’ responses as they liked.

Participants

Ten Music Therapists were recruited to participate in an online focus group for 6 weeks. Ten was the chosen number of participants because it was found by Vaughn, Schumm, and Sinagub (1996) that focus groups work best when comprised of 8 to 10 participants and a moderator. These Music Therapists were contacted through email
by using the American Music Therapy Association (AMTA) list of members. The list was specific to those Music Therapists who were board certified and had self-reported experience working with individuals with ASD. Four hundred and seventeen certified Music Therapists were approached through email based on the list provided by AMTA. The Institutional review Board (IRB) of Ohio University approved the study.

In order to be eligible to participate, the Music Therapists needed to meet the following criteria: a) be board certified, b) have 5 years of experience in practice, c) have a high competence of working with augmentative and alternative communication (AAC) based on years of experience with AAC devices and the number of non-speaking children they’ve worked with the past 3 years, d) and be currently working with a non-speaking child with an ASD. The type of therapy that the Music Therapists used was not factored in as inclusion or exclusion criteria because they generally use more than one type of therapy depending on the unique nature of the person in Music Therapy.

The 10 participants consisted of 9 females and 1 male Music Therapist. The participants ranged in age from 29 to 53 years ($M = 38.1$). Four of the participants were board certified for 5-7 years, 1 for 8-10 years, 2 for 11-20 years, and 3 for more than 20 years. Table 1 provides more information about the demographics of the participants. Pseudonyms are used to protect the privacy of the participants. Two participants did not complete the full study, with Nicole only having completed the first week, and John only having completed weeks one and two. Their contributions
### Table 1: Demographic Information of Participants

<table>
<thead>
<tr>
<th>Participant*</th>
<th>Lynn</th>
<th>Sue</th>
<th>Marie</th>
<th>Nicole</th>
<th>Jack</th>
<th>Jennifer</th>
<th>Liz</th>
<th>Sarah</th>
<th>Emily</th>
<th>Amber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest level of education completed</td>
<td>Bachelors</td>
<td>Bachelors</td>
<td>Bachelors</td>
<td>Masters</td>
<td>Masters</td>
<td>Bachelors</td>
<td>Bachelors</td>
<td>Bachelors</td>
<td>Bachelors</td>
<td>Bachelors</td>
</tr>
<tr>
<td>Number of children participant has worked with</td>
<td>200</td>
<td>15</td>
<td>50</td>
<td>35</td>
<td>100+</td>
<td>15</td>
<td>100+</td>
<td>50+</td>
<td>500+</td>
<td>300-400</td>
</tr>
<tr>
<td>Number of children with ASD that participants have worked with</td>
<td>50</td>
<td>20</td>
<td>5</td>
<td>20</td>
<td>50</td>
<td>8</td>
<td>20</td>
<td>20+</td>
<td>150+</td>
<td>50</td>
</tr>
<tr>
<td>Number of non-speaking children treated over the past 3 years</td>
<td>Therapy Clinic or Studio</td>
<td>Therapy Clinic or Studio</td>
<td>Public School</td>
<td>Public School</td>
<td>Private School</td>
<td>Client’s Home</td>
<td>Public School</td>
<td>Client’s Home</td>
<td>Therapy Clinic or Studio</td>
<td>Therapy Clinic or Studio</td>
</tr>
<tr>
<td>How many clients who use AAC outside of therapy use AAC in therapy?**</td>
<td>Most</td>
<td>Most</td>
<td>All</td>
<td>Some</td>
<td>Few</td>
<td>Most</td>
<td>All</td>
<td>Most</td>
<td>All</td>
<td>Most</td>
</tr>
<tr>
<td>Kind of Additional training in AAC</td>
<td>Individual training by an SLP</td>
<td>None</td>
<td>Professional workshop</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Course at a university, college, or community college</td>
<td>None</td>
<td>Individual training by an SLP</td>
<td>Individual training by an SLP</td>
</tr>
</tbody>
</table>

*Names have been changed to protect privacy of participants.

**All (100%) Most (99%-65%) Some (64%-35%) Few (less than 35%) None (0%)
were still included in the data analysis. Participants were compensated ten dollars after completing week one, ten dollars after completing week three, and forty dollars after completing all six weeks, for a total of sixty dollars.

**Materials**

The online focus group took place using the password protected online forum phpBB, which is an online forum bulletin board that can be used to communicate with a group of people. By using this site, a forum was created that could be accessed by all of the participants at their own convenience from their various locations across the United States. The researcher was also able to control the settings of this forum as well as serve as a moderator through the administrator settings. This online system was housed on a central server under the IT department of OU. Pictures below show the phpBB interface that was used.
After providing a signed consent form, the prospective participants were provided with a link to complete the screening and demographic questionnaire through the online site Qualtrics. Qualtrics is an online software that allows individuals to create surveys as well as review and analyze the results. Below is a picture that depicts the Qualtrics interface.
The questionnaire consisted of 16 questions to collect background information from each participant as well as to make sure that the participants met the inclusion criteria for the study. To make sure that the participants had a high rating of competence working with augmentative and alternative communication (AAC), the participants had to rate their skill level of using AAC within their sessions. Participants were given a 5-point scale and asked how they would rate their skill level using AAC within their sessions. The rating scale consisted of: 1-none, 2-minimal, 3-medium, 4-high, and 5-expert. Five of the participants rated themselves medium and five of the participants rated themselves high, but this was deemed acceptable for this
study based on the other information provided in the participants’ demographic screenings. Each of the participants completing the questionnaire were matched with a numeric code to ensure that the questionnaire did not contain any identifying information.

Six questions were used in the focus group discussions. These discussion questions were created in an open-ended format in order to elicit detailed responses from the participants. The six questions were developed by the researchers and modified based on feedback from two board certified Music Therapists with experience working with children requiring AAC and children with ASD. The final version of the six questions are attached in the Appendix A. These questions focus on the benefits and challenges of using music to help children with ASD reach their communication goals, why music might have a beneficial impact on communication skills in children with ASD, using AAC devices, information that can be given to speech language pathologists on incorporating music into therapeutic sessions, and other areas on the use of music with children with ASD. The focus group extended over a period of seven weeks, due to Thanksgiving falling during the study. Each question remained open through the course of the study in order to allow continued responses and discussion as well as to allow flexibility to the participants. The number of posts per participants per question is located in Table 2. It should be noted that Table 2 does not indicate the length of a post or whether or not the post was made in reply to another’s responses. In many cases, posts were quite long and addressed comments made by others. Consequently, the interactivity of posts is not represented
in the table. It should be noted, however, that the first few posts were usually independent replies to the questions and the rest included some sort of reply to those posts. Also, many times, if a participant posted more than once, the first post was more related to answering the question and the subsequent posts were related to responses of what other participants had said.

Table 2: Number of Forum Posts Per Week

<table>
<thead>
<tr>
<th>Participant</th>
<th>Lynn</th>
<th>Sue</th>
<th>Marie</th>
<th>Nicole</th>
<th>Jack</th>
<th>Jennifer</th>
<th>Liz</th>
<th>Sarah</th>
<th>Emily</th>
<th>Amber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Week 2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Week 3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
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</tbody>
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**Procedures**

After receiving the signed consent form, participants were directed to complete the demographic and screening questionnaire. After 10 Music Therapists were determined to meet the inclusion criteria and were asked to participate in the focus group, they were given a login and password to access phpBB. In the case of this study, ten Music Therapists responded to the invitation to participate in the study, but
they all met the inclusion criteria. Each participant was given their own individual account with a first name identifier. First names were used because participants would most likely have used their first names as identifiers if the focus group was held in a face-to-face setting. One participant did ask to use a pseudonym. In this thesis, pseudonyms will be used to identify participants. The researcher served as the moderator and posted the weekly discussion questions, sent reminder emails, and posted key topics that were discussed. Also, participants were reminded not to share any identifying information that should be kept confidential about clients when responding to the questions. Before the first question was posted, the moderator posted a welcome message in order to make sure that the participants would be able to navigate the online forum site.

Data Analysis

The responses to the questions were transcribed from the online focus group forum into an excel document and then analyzed, broken into thought units, and analyzed for themes according to the procedures used in McNaughton, Light and Arnold (2002) to offer information as to why music has a beneficial impact on communication skills of children with ASD and how speech language pathologists can use music in their therapy sessions with children with ASD. Thematic analysis was done on an iterative basis by assigning initial themes to thought units based on individual content and then collapsing themes with similar context. Theme names and membership were considered after each round of collapsing until no further reduction could be reached.
**Reliability**

Interrater reliability for the formation of thought units was calculated by a second coder independently identifying thought units from 20% of the responses to the questions posted in the forum. Prior to coding the responses, the second coder was trained by reviewing samples and categorizing thought units with the primary researcher. The percent agreement was calculated by dividing the total number of agreements by total number of agreements and disagreements. The overall percent agreement between the two raters was 84.2%. Interrater reliability for the categorization of thought units into themes was created by the second coder identifying themed from 20% of the total thought units after practicing with the primary researcher. The percent agreement was calculated by dividing the total number of agreements by the total number of agreements and disagreements. The overall percent agreement between the two raters was 82.6%.

**Results**

There were 1,353 thought units. These thought units were coded into 5 themes with seventeen total subthemes. These themes include benefits, challenges, roles AAC play, advice, and other. Table 3 shows the coding manual used to categorize themes and subthemes as well as the number of thought units for each of the seventeen subthemes.
## Table 3: Coding Manual

<table>
<thead>
<tr>
<th>Theme</th>
<th>Subtheme</th>
<th>Thought Units per Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits – This theme consisted of benefits of using music with children with complex communication needs and ASD.</td>
<td>Motivation and Reinforcement – Music is fun and creates a safe environment that allows for a better therapeutic relationship. Also, through reinforcement, children can have the motivation needed to reach their communication goals.</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Neurology – Because an individual with an ASD has a different brain than someone with a typically developing brain, music can use all portions of the brain and strengthen connections that can alleviate some of the symptoms of ASD. Research specific to neurology was also discussed.</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Total Improvement – The use of music creates a total overall improvement in both communication and non-communication skills and makes an individual’s life better in all aspects.</td>
<td>123</td>
</tr>
<tr>
<td></td>
<td>Motor, Life, and Social Skills – Music can specifically target non-communication skills, such as turn-taking, eye-contact, social skills, interaction, and movement.</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Capturing the Benefits – Assessments are done in order to create communication goals as well as reassessments in order to determine if those goals are being reached or if the goals need to be amended. Some forms of assessment include counting the number of occurrences</td>
<td>140</td>
</tr>
<tr>
<td>Challenges- This theme consisted of challenges of using music with children with complex communication needs and ASD.</td>
<td>Learned Behavior vs. Communication – Is an individual showing their actual preference or rather a learned behavior?</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Generalization – Will the individual use skills learned in therapeutic</td>
<td>22</td>
</tr>
</tbody>
</table>
Dividing Attention Between Music and AAC – Using instruments or musical activities can be difficult when an individual is using AAC. This can be due to technological problems, either with the individual or the Music Therapist, or to distraction. The individual could become distracted by the system or other applications within it.

| Roles AAC plays – This theme consisted of the roles that Music Therapists have seen AAC play in their therapeutic sessions. | Individual’s Voice – AAC provides individuals with a form of true communication rather than simply being a device they use. | 128 |
| Provides Control – AAC gives individuals control over situations and a sense of independence that might otherwise be lacking. | 22 |
| Provides Choices – AAC provides individuals with choices so that they may have help if they are stuck or cannot find what they want to say. | 32 |

**Advice** - This theme consisted of advice that Music Therapists gave to Speech-Language Pathologists when trying to incorporate music into therapeutic sessions as well as when collaborating with other professionals.

| Keep it Simple – Start with simple goals and interventions. Also, keep terminology and explanations simple when explaining to others. It is important, however, to be conscientious about others’ prior levels of knowledge so that they will not become bored, uninterested, or offended with a too-simplistic explanation. | 30 |
| Collaborate Effectively with a Music Therapist – By collaboration, Music Therapists and Speech-Language Pathologists can work together to find the best interventions and care for clients. They are able to share ideas with each other, such as interventions or goals. | 98 |
| Be Confident, not Self-Conscious – Be willing to try new things, such as singing or dancing, rather than being | 22 |
afraid due to personal limitations, such as not being able to sing. Clients will not care because they are receiving the best care possible.

**Maintain Appropriate Expectations and Considerations** – Do not assume an individual is not competent just because they cannot communicate. Also, it might take time for an intervention to work, so allow the individual to have this time. Do not forget to consider outside influences, such as parent or teacher involvement, knowledge of interventions and/or AAC systems, and technological capabilities, or culture and/or socioeconomic statuses.

**Use Resources** – Use examples from TV, magazines, celebrities, etc... Also, use a Music Therapist as a resource. Do not shy away from research, as well. There is a multitude of research showing the benefits of using music with children with complex communication needs and ASD.

**Other** – This theme consisted of conversation fillers, examples, recommendations, greetings, etc... that did not contribute to any of the overall themes or subthemes.

These themes and the subthemes that they consist of are explored below.

**Benefits**

The theme of benefits consisted of five subthemes including: Motivation and Reinforcement, Total Improvement, Neurological, Motor, Life and Social Skills, and Capturing the Benefits. All of these themes focused on the benefits that music
provides, how music provided benefits in both communication and non-communication skills, or how these benefits were measured.

**Motivation and Reinforcement.** Many of the participants explained that motivation and reinforcement were two reasons that they believe music is beneficial in helping communication goals. As participants stated, music creates motivation, encouragement, and reinforcement of communication and non-communication skills through the use of instruments and musical activities. Music creates motivation because it is enjoyable and provides an outlet as well as opportunities for vocalizations and communication. Participants also explained that because music is fun and can make an individual forget they are at a therapy session, he or she might be more motivated to participate in therapeutic activities and work toward his or her communication goals. Also, it was stated that having a child participate in communication before they are given something they want, such as an instrument to play with, motivates them to communicate. When they are given the instrument, or thing that they want, it reinforces their ideas about communication. As stated by Sue, “I feel that making choices through non-verbal means and having this communication be reinforced by music (a positive reinforcement) encourages the individual to increase communication attempts and understanding of the cause/effect of communication.” By creating motivation and reinforcement through the use of music, individuals are more likely to try to make vocalizations and attempts at communication.
**Total Improvement.** Participants indicated that using music is beneficial because music creates an overall improvement, from communication skills to motor and life skills. By using music in therapeutic sessions, the participants noted how they saw total overall improvements in their clients. These individuals improved in both non-communication skills and communication skills. By creating a safe and comfortable environment, these skills, which are addressed in individual goals, can be improved. The participants stated that one reason music creates this safe and comfortable environment is because individuals can sometimes forget they are in therapy due to the fun, interactive nature of musical activities. Through music, interaction and co-activity can be created and then these skills can be taught. Also, the participants discussed how music can be used to encourage vocalizations and language growth. Jack explained this by stating, “The music, therefore, becomes a means of interaction – teaching reciprocation, cause/effect, waiting, co-activity, listening, flexibility – all tools necessary for communication.” So, by using music to teach non-communication skills, communication skills can be increased as well.

**Neurological.** One of the biggest themes under the category of benefits was neurological. Most of the participants stressed the neuroconnections and music’s effect on them. The participants discussed how using music is beneficial to the brain’s connectivity because music assesses different portions of the brain and uses the whole brain simultaneously, therefore strengthening weak connections that can address motor issues, such as movement or speech. Emily goes more in to depth by explaining:
“I then also reference the research on how rhythm optimizes neuroconnections, strengthening weak ones and creating connections where there are none. I then reference back and describe some of those weak connections in someone with autism -describing behaviors and that through the application of music we can strengthen neuroconections and drive changes in the brain.”

Participants speculated that because individuals with ASD have weak neuroconnections, and music has been shown to strengthen weak connections as well as create new connections, this could be why music is so beneficially to those individuals in particular. By strengthening the weak connections and creating new ones, motor issues, including those needed to create speech, can be improved greatly through the use of music.

**Motor, Life, and Social Skills.** Aside from total improvement, the subtheme of motor, life, and socials skills was greatly present. The participants stated and gave several examples of how their clients progressed in motor movements, and life and social skills, such as turn-taking, eye contact, etc…, through the use of music.

Discussion indicated that using music is beneficial because music can teach these non-communication skills. Individuals can learn many important skills through music either directly or indirectly. Specific skills cited include becoming and remaining calm, practicing independence, developing self-regulation, learning to decrease negative behaviors, increasing attention skills, increasing social skills and interaction, increasing turn-taking, developing self-expression, developing oral motor skills, developing and motor skills. The teaching of these non-communication skills is dependent upon individual goals. Sue described this by saying, “Music is a great way to teach and reinforce basic concepts of on/off, stop/go, in/out, fast/slow, yours/mine,
etc. which I feel are very important for safety, social skills, and daily life skills.” The participants noted that by using music to teach non-communication skills, individuals can learn to be self-sufficient and independent as well as learn foundational skills that can help them vocalize and communicate better and more efficiently. Again, music can teach these non-communication skills because musical activities are fun and engaging as well as providing motivation and reinforcing desirable behaviors.

**Capturing the Benefits.** Participants outlined several ways that the benefits of using music can be recorded, such as by finding baselines during an initial assessment and then reassessing and monitoring progress of individual goals. Charts, video and audio recording, or tracking occurrences can be used to determine progress and if goals need to be amended. One Music Therapist, Amber, described her method of recording as: “I do give speech trials within each session and assess measureable speech/communication outcomes as I go, but my focus is more about looking at the change/improvement from start to finish or start to re-assessment.” Participants discussed why assessments and recording baselines are very important. The reason for this is to know if a client is making progress to his or her goals as well as to determine if goals should be amended. By comparing data recorded throughout sessions to data obtained at the beginning during the initial assessment, therapists can see whether a certain intervention or activity is or is not helping the client to reach his or her goals. If progress is seen, the intervention technique is working and appropriate for the client, and only a few minor changes might be needed. If no progress is seen, the intervention technique is not working and the therapist needs to think of a way to
amend the goal or intervention in order to reach the outcome that is wanted. The participants noted that therapists do need to keep in mind, however, that sometimes progress might not be seen for a measurable amount of time and then suddenly the client will show progress. If no progress is seen immediately, rather than change the intervention or goal completely, time should be given to see if the client needs a longer response time or longer time to make a measurable amount of progress.

Challenges

The theme of challenges consisted of three subthemes including: Learned Behavior vs. Communication, Generalization, and Dividing Attention Between AAC and Music. All of these themes focused on the challenges that come with using music in therapeutic sessions.

**Learned Behavior vs. Communication.** Participants noted that one challenge of using music is that it can be unclear if an individual is discriminating their actual preference and developing communication skills or merely showing a learned behavior expected of them. Liz explained this challenge in the following way:

“Another challenge, whether able to communicate or non-verbal communication, knowing if the child or adult knows what he/she is actually saying; especially in terms of feelings. I find that kids are so quick to use vocabulary learned by them hearing others tell them "you are anxious" but they have no idea what this actually means.”

Because behavioral principals may be used to teach these individuals, it can be difficult to know if they are being taught an expected response or actual communication and non-communication skills. For example, when using a system like
AAC, the individual could be pushing a button or pointing to a picture and have no idea what it means, but are doing so just because they know they are expected to or supposed to push a button or point at a picture.

**Generalization.** Discussion also revolved around whether skills taught with the use of music will and can be used outside of the musical environment. Will individuals be able to communicate and use other non-communication skills, such as turn-taking, regulation, and independence, they have learned with the use of music in a non-musical setting such as at home or at school? Liz explained how generalization can be hard because music provides necessary motivation: “However, of course, the goal is not just communication during my sessions, but throughout their day. With some of my kids, very few other things seem to motivate them.” Generalization is one of the main goals of therapy. With therapy, goals are created and hopefully reached that include non-communication and communication skills. These goals are not truly reached, however, if the individual cannot use the skills taught in therapy outside of therapy, such as at school or at home. Also, the individual may be able to reach the goal with the use of music but not be able to use those skills when there is no musical presence.

**Dividing Attention Between AAC and Music.** Participants were certainly in favor of using music, but noted that a challenge of using music is that the requisite attention to music in order for it to be beneficial, such as playing an instrument, can be difficult with an individual using an AAC system for several reasons. The individual could easily become distracted by an AAC device itself, choices offered, or by other
programs installed on the device, such as on an iPad. Many of the Music Therapists agreed that distraction can be a huge challenge. Individuals sometimes navigate away from the AAC system if capable to do so on devices such as the iPad and start to do other things, such as play games. This can draw the person’s attention completely away from the therapeutic intervention. When the therapist is using an instrument, for example, it can be difficult to stop this distraction from happening. Also, an individual might need help in order to use the system, and this means that valuable time might be lost when spending it teaching rather than on the musical intervention. Marie explains her troubles with using AAC systems through the following:

“When using a device, guidance is often needed and I either need to stop playing to use hands on assistance or I keep going and hope they use the device correctly. When I stop playing, I feel like I’m being more of a therapist because I’m really helping with learning those intricacies of how the client is communicating, but I feel a lack of music.”

Roles AAC Plays

The theme of roles AAC plays consists of three subthemes including: Serves as an Individual’s Voice, Provides Control, and Provides Choices. All of these themes focus on the roles that AAC plays when using it in therapeutic sessions.

Serves as an Individual’s Voice. Participants discussed the idea that when using music, AAC serves as the individual’s voice. It is used so the individual can communicate and participate. Sometimes the AAC device has a limited vocabulary and this can frustrate the individual. As Amber stated:

“And then, what if what they are thinking and wanting to communicate is more high level than what the device we are providing can offer? How much
satisfaction comes from touching a picture of a generic drum, when what you want to say is "I'd like to play the djembe."?

The participants were quick to state that even though an AAC system can serve as an individual’s voice, it might not adequately express their thoughts, needs, or wants which could lead to some frustration and/or negative behaviors. AAC systems, despite this limitation, provide a means of true communication that can help them achieve their therapeutic goals of both communication and non-communication goals. Emily reiterated this important point, “The device, the system, is their voice. If it is not treated as such in all environments, it will never truly be that.” The participants also noted how it can also be challenging to know when to use and when not to use AAC systems in a session. Sometimes an individual needs the system at all times, but other times an individual would benefit from not having the system and having to use other means of communication.

**Provides Control.** Control was a topic of some discussion throughout the study. Participants explained that by using an AAC system while using music, the individual is given control and independence. Even if the individual uses it to communicate something that is not an option, they are still able to do so while simply being redirected. By doing this, the therapist is acknowledging that the individual is able to make choices and have an opinion but that what they have chosen is not available at the time in order to reinforce and encourage more communication. By having control and independence and being able to communicate, frustration can be diminished along with negative behaviors. As Liz explained:
“At least by using an AAC system, they are able to exert some control in the world. This can lead to behaviour [sic] improvements as well, because they are learning they can be heard in positive ways rather than using negative behaviours [sic] to get their message across.”

**Provides Choices.** Participants also discussed how AAC systems provide individuals with choices so they are better able to communicate, interact, and participate. Lynn explained the use of choices through the following, “…we only use it [AAC] occasionally... or if the student is having trouble making a decision, and if they have a music page, it might help provide them with choices.” By having the AAC system close by during a session, the individual can have choices available to help them communicate if they are unable to verbalize their wants, needs, or thoughts or if they get “stuck.” This makes the session run smoother because the individual is able to fully participate rather than become frustrated with being unable to communicate.

**Advice**

The theme of advice consists of five subthemes including: Keep It Simple, Collaborate Effectively with a Music Therapist, Be Confident, Not Self-Conscious, Maintain Appropriate Expectations and Considerations, and Use Resources. All of these themes focus on things that SLPs can do in order to effectively collaborate with a Music Therapist as well as ways that SLPs can incorporate effectively music into their therapeutic sessions.
**Keep It Simple.** Participants advised that when explaining the Music Therapy profession or Speech-Language Pathology profession, keep it simple and accommodate to prior knowledge of the individual, such as using laymen’s terms or examples to help demonstrate your reasoning or explanation. Try not to make the person feel ignorant or uneducated, either by using too simplistic of terms or too intricate of terms. Everyone may be on a different level of prior understanding. Also, the participants noted that Speech-Language Pathologists should start with simple goals and interventions. Do not try too complex of goals starting out or the intervention might not have a chance of working. Sue gave the following advice, “I think empowering them [SLPs] to expand on what they are doing by starting simple and then working from there. Give them a technique to incorporate each month that is simple and not too complex.” Starting simple can give a foundation that can then be built upon and improved for use in future sessions.

**Collaborate Effectively with a Music Therapist.** Participants were quick to state that co-Therapy and collaborating with a Music Therapist will help both people learn from each other as well as provide the best experience for the client. Both can discuss ideas and interventions, develop an appreciation for each other’s fields, and support each other. As stated by Jennifer, “Trading ideas and leaning on each other’s expertise is going to make clients receive the best of all worlds.” Do not be afraid of working with a Music Therapist. Both Music Therapists and Speech-Language Pathologists look at situations differently and have different approaches. Through collaboration, the best approach can be found and the client can receive the best
treatment needed for his or her individual situation. Both professionals can help each other grow and improve techniques and interventions that in the end help to improve both communication and non-communication skills. As Sue stated, “I love collaborating and you typically learn so much in the process. If others know you really enjoy collaborating, they are often more open to working together.” Also, Jennifer explained:

I actually have a speech pathologist that I currently discuss and share clients with her. We will discuss the things that we both do in sessions and get ideas and suggestions off of each other. We have planned specific activities together and shared apps that we have on our iPads that we work with. I will come to her with ways to address certain issues with clients and she will ask me for suggestions as well.

**Be Confident, Not Self-Conscious.** Jennifer’s advice was: “Being comfortable doing different/unfamiliar tasks and sometimes even acting silly or overly outgoing is the biggest helpful tool that anyone can have.” In order to effectively use music in therapy, therapists must be confident and open-minded to try new things that might be out of their comfort zone. Be confident to be creative. Clients don’t care how someone sounds and if they can sing or not. In the end, all that matters is that the client is receiving the best help possible.

**Maintain Appropriate Expectations and Considerations.** Participants discussed the importance of always having background information on the client, such
as type of disability, culture, sensory needs and limitations, behaviors, etc… Also, know what is going on outside of therapy, such as parental education, adaptation of therapy interventions and AAC systems, and implementation. All of these things can greatly impact an individual’s communication as well as his or her response to therapy. For example, if parents do not know how to use an AAC system, it might not be used at home. This could hinder any progress in communication goals. Also, participants advised to not set unrealistic goals or immeasurable goals. More importantly, do not underestimate the client’s competence. Just because an individual is not communicating does not mean that he or she is ignorant or illiterate. There are several other reasons that the individual might not be communicating, such as not knowing how to work an AAC system or not believing that what they say is worth the effort. Emily made a point in saying, “Thus the biggest challenge is not taking the person with autism at face value… The challenge is "forgetting everything you think you know, opening your minds to learn…” as an individual with autism once said so eloquently.”

**Use Resources:** Use resources, such as T.V., magazines, or research, to help use music in therapy sessions. Even asking Music Therapists for examples can be beneficial. Also, looking at the research can provide evidence of the benefits of using music. By regarding research that has been done, music can be seen as a valid therapeutic technique that should be taken advantage of and used more often. Jennifer explains how new techniques are considered when evidence is given through research: “This is a concept [body preparation] that many SLPs I work with have never
considered, but they find it quite helpful once they are introduced to the idea and the research behind it.”

**Other:** Includes fillers, greetings, transitions, reading suggestions, recommendations etc…

**Discussion**

This study considered the experiences of Board Certifies Music Therapists in working with individuals with ASD. The challenges of using music in therapeutic sessions, the roles AAC plays in these sessions, and advice for Speech-Language Therapists were explored in depth. This study not only provides more information in an area where literature is lacking, but also provides information that will aid both Speech-Language Therapists and Music Therapists in collaboration and the use of music to help with non-communication and communication goals. Also, this study serves to be a foundation for future research into why music is beneficial to communication skills of children with complex communication needs and ASD. The focus group had a rich set of discussions generating 1,353 though units.

**Benefits**

This was one area of great discussion among the participants. They frequently mentioned that music is motivational and has a neurological impact, and from their discussion it seems a key point for why music has a beneficial impact, especially on communication skills of children with complex communication needs and ASD. For
Speech-Language Pathologists, the fact that music creates motivation and reinforcement is something to keep in mind. Children may be more open to taking risks and more motivated to complete communication goals when music is involved. Because they are receiving something they want, i.e. music or and instrument, or because they are having fun, children don’t necessarily see therapy as work or something they do not want to do. Music can be a positive way to motivate the individual reach his or her non-communication and communication goals. The group suggested that neurological changes were also a benefit that actually translated into improved performance. Either way, according to the participants, using music brought about total improvements in these individuals’ lives where other therapeutic methods did not. This evidence of total improvement along with specific improvement in motor, life, and social skills should motivate Speech-Language Pathologists to use music in therapy sessions as well as to collaborate with Music Therapists so that individuals are receiving the best possible method in order to facilitate growing and higher levels of communication. The idea that music provides motivation is one area that needs to be explored in greater depth. For example, the specific features of music (match of musical interest, novelty of musical instruments, open ended approach, or the low demand/high success nature of therapy) could be explored. Study would require systematic variation in these features. Qualitative research helps to affirm these factors for further study.

Along with motivation and reinforcement, music and its neurological impact was a key theme. Because music may strengthen connections in the brain as well as
form new ones, and ASD is known for having characteristics of brain irregularities and abnormal levels of neurotransmitters, music may be able to create new pathways in the brains of individuals with ASD. This would potentially allow some of the main symptoms, such as motor and communication deficiencies, to be alleviated. While this is still a highly unresearched area in regards to these disorders, it is something to explore. There are significant barriers to brain scan study of music with children with ASD, however there is some research to suggest that some neurologic tracking is possible with this population. For example, in a study by Dapretto, Davies, Pfeifer, Scott, Sigman, Bookheimer, and Iacoboni (2005), children with Autism underwent fMRI scans in order to determine if mirror neurons in the inferior frontal gyrus responded the same when imitating and observing emotional expressions when compared to individuals without autism.

When discussing how to capture these benefits, recording baseline assessments and taking assessments throughout the intervention is key because if no progress is being seen, a goal or the intervention might need to be changed in order to more effectively address the issues and needs of the individual. Also, this data can be used as evidence of the benefits of using music with these individuals. It can be difficult documenting progress and the reason it is occurring, however, because qualitative information, such as things that happen in a narrative format, can be more challenging to use to determine if a goal is being met. It can then be difficult to track why certain benefits are happening when compared to quantitative information. For example, how can you show if a benefit is caused due to motivation or changes in the brain when all
that is present is data showing that communication or non-communication skills improved? As previously discussed, future research could help to resolve some of these lingering questions.

**Challenges**

When asked about the challenges of using music to help with communication goals of children with ASD, challenges that are faced when using any intervention were discussed as well as challenges strictly found when using music as an intervention. This was an active topic of conversation throughout the entire study, and the participants explained, rather than complained, about issues and challenges they had faced and also offered ways they had tried to contest these complications. Some participants even went so far as to offer advice to other participants in ways that these challenges could be confronted. The topics brought up were not actually unique to Music Therapy and impact Speech-Language Pathologists, too.

When it comes to discrimination, Speech-Language Pathologists have several ways to make sure an individual is actually discriminating, such as wanting to hear a certain song or play a certain instrument. For example, to see if a client is discriminating one thing from another, one can change the scenario or switch certain things around so that the response is not the same every time. For example, in order to tell if a client really means they want to play a specific song when he or she hits a certain button, offer two or three buttons, change the order the buttons appear, and only play the song when the client hits the correct one. This makes it so that the client
would have to know which is the correct response, such as what button to push or which picture to choose without varying the locations of options. It is difficult to know if the individual is attending and purposefully selecting or just pushing the button because he or she knows that’s what he or she is expected to do. Speech-Language Pathologists also use choices between preferred and non-preferred objects or activities to ensure a child has intentionally made a choice. Use of a null-symbol or choice when nothing happens is also an option. Addressing issues of intentional choice is an area well suited for Speech-Language Pathologist and Music Therapist collaboration. This is a key way in which collaboration could be beneficial for both professionals and individuals with complex communication needs and ASD.

Generalization this is another area where Speech-Language Pathologists can offer their expertise, because they too encounter this problem with the goals they try to teach their clients. While it can be hard to know if an individual is using what they learn during therapy outside of therapy, there are several ways that this can be addressed. Collaboration and regular contact with team members to monitor progress toward goals in multiple areas is important. Parents and teachers are tools that can be used to help with assessment as well as to help see if what is being taught in therapy sessions is being generalized across all aspects of the individual’s life. None of the participants specifically noted any ways to remedy the problem of generalization, and this could be because they are not exactly sure of specific ways to do so, or more likely that it simply did not come up in the discussion.
Aside from these challenges that are faced with any therapeutic invention, there are specific challenges that come from using music during therapy. One of the main challenges the participants noted was dividing attention between AAC and music. Because some individuals might not know how to use certain AAC systems, as noted by several of the participants, time might have to be spent teaching technological aspects of the system rather than it being dedicated to the therapeutic intervention. Music Therapists vary their training background with AAC, so many might find that they themselves are not able to use the systems or teach children how to use them. None of the participants stated that they needed additional training in AAC, but by looking at their self-rating in skill of using AAC, it is clear that additional training would be beneficial. Also, many times children are given these systems without little explanation on how to correct use them, and this can negatively impact their use of the systems. Alternatively, the system itself may not be optimally set up to allow for movement in and out of music activities. For example, music related vocabulary may not be centrally located on a system. Speech-Language Pathologists can help address some of the technological problems the individual is having while also helping the Music Therapist learn how to use the system. Also, because many AAC systems may be on non-dedicated devices, such as an iPad, individuals can become distracted by other programs on the system. One participant gave advice for this, however. On iOS systems, it is possible to lock the screen on a certain program so only that program may be accessed by the individual. Another possibility would be to load music related apps onto a system so that there is not as
much of a need for divided attention. The drawback is that communication apps are still required for structured responses. In some cases, a focus on unaided means might be more appropriate depending on the nature of the activity. This is one area which collaboration could greatly benefit. These systems could be redesigned with the help of both Speech-Language Pathologists and Music Therapists in order to better integrate music meaningfully into the systems, communication, and therapeutic inventions.

**Roles AAC Plays**

When discussing the roles AAC plays in Music Therapy, functional communication related to music and related to practical input on the session were explored. Participants stressed how AAC provided individuals with a way to truly communicate by providing a way to exert control upon their lives as well as provided them with choices. Without AAC, these individuals would not be able to communicate. AAC should therefore not be seen as a device or something they use, but rather their true form of communication. By recognizing this, frustration can be reduced which can lead to a reduction in negative behaviors. By being given the ability to communicate through the use of AAC, these individuals are finally given their own voice and communication can be facilitated. There is something to be said about music being liberating and freeing as well. Music offers a unique opportunity for these individuals to express themselves that might not otherwise be available. This can be another advantage to using music along with AAC because individuals are given complete control and independence.
Another aspect to using AAC, however, is that sometimes the limited vocabulary provided by the AAC system can cause frustration. These individuals have a means to communicate but find that what they want to communicate is not available. This is important to keep in mind if an individual is presenting negative behaviors. None of the participants discussed ways to repair this issue, however. It is possible to add vocabulary to the AAC systems yourself, or it could be possible to communicate with the person who programs the system in order to widen the scope of vocabulary placed within the system. Finding ways to include the child in adding vocabulary to these systems can also be engaging, as well as collaborating with a Speech-Language Pathologist.

Also, many individuals with ASD become frustrated because they cannot communicate, and AAC gives them the ability to do this. By being able to communicate, the individuals can then make decisions, express their wants, thoughts, needs, etc… They are finally given some amount of control over their own lives that is not possible without the help from an AAC device. Also, an individual may sometimes get stuck trying to communicate and an AAC system can provide choices that makes it easier for he or she to communicate what it is he or she wants to say. By providing both choices and control, it is important to remember that AAC gives these individuals the ability to communicate in a very individual and unique way that makes them feel like a true person, and that should be embraced.

Advice
It is important to note that just as Speech-Language Pathologists do not expect Music Therapists to practice Speech-Language Pathology, Music Therapists do not expect Speech-Language Pathologists to be Music Therapists. The same principals of carrying over information, discussion, and collaboration apply. The participants, however, gave a wealth of information and advice for Speech-Language Pathologists on how to incorporate basic music interventions into therapeutic sessions; some focused on what Speech-Language Pathologists can do on their own and some focused on collaboration with Music Therapists. Specifically participants recommended others start with easy interventions, and not to be afraid to ask for suggestions. Many Speech-Language Pathologists have no background in music, because it is not required. A logical approach is to incorporate music into sessions and work one’s way up. Also, using music can be distressing because it is unfamiliar. Participants suggested comfort level was an issue with some Speech-Language Pathologists. Music Therapists suggested that clients, however, do not care if you can’t sing or play an instrument perfect. Rather, it’s the fact that you are trying an intervention that could help them benefit in the long run that is important. Do not be afraid to try new things, and if help is needed do not be afraid to ask someone, such as a Music Therapist. No one will be looked down upon, because the client’s needs are being put first. If a mistake is made, move on and learn from it rather than let it be defining. Along with this, use resources. There are so many resources readily available, such as magazines, T.V., journals, research articles, etc… To help use music in your sessions, use resources, which includes a Music Therapist. There are plenty of resources for musical activities,
interventions, goals, etc… that you can use in your sessions. Don’t be afraid to branch out and use what is around you.

Goals and expectations in music need to treat appropriate levels for the client just like with communication goals. Expectations that are too high for a child’s level can result in frustration while those too low can affect motivation. Consultation with a Music Therapist is important in establishing realistic musical expectations.

One of the most important pieces of advice was to collaborate effectively with a Music Therapist. Both individuals have different skills to offer and if both work together, the best techniques to help clients can be discovered. In the past, collaboration between Music Therapists and Speech-Language Pathologists has been limited and known to have been apprehensive, but several of the participants stated how they enjoy working with Speech-Language Pathologists and how it can better the therapy interventions and outcomes for clients. Several participants explained why collaboration can be a positive experience because both people learn about each other’s profession and can help each other with interventions to create the best experience for the client.

Putting aside differences and doubts, both Music Therapists and Speech-Language Pathologists could bring so much, in quality, quantity, and variety, to the table that would in the end benefit the clients in such a way not possible without collaboration. When looking at this, it is clear that more collaboration should be happening between Speech-Language Pathologists and Music Therapists. It is unclear
why this collaboration doesn’t happen more. It is possible that Speech-Language Pathologists might let insecurities and doubts about the validity of using music to help with communication goals stop these collaborations from happening or they lack the confidence in their own musical abilities to incorporate music. In the future, Speech-Language Pathologists and Music Therapists should seek out opportunities for collaboration.

By remembering all of these pieces of advice, Speech-Language Pathologists can be better prepared to incorporate music into their sessions as well as be able to more effectively collaborate with Music Therapists. Also, by recognizing some of the challenges that Music Therapists face in their sessions, Speech-Language Pathologists can offer advice of their own to help with these challenges while recognizing some of the key benefits that come with using music in therapeutic interventions.

**Limitations**

There were a few limitations to this study. Because it was a focus group, it consisted of a small number of participants. Themes might have been different with a bigger group. Also, because the focus group was conducted online, there was the challenge of keeping up with regular online discussions because of busy schedules. While participants remained involved, more interaction and responses might have occurred if this was a focus group conducted live in one or two sessions. Finally, also due to the online focus group, the study consisted of text only. The participants might
have wanted to demonstrate certain points or examples had this study been conducted live.

**Future Directions**

This study sets up several future directions. One would be to have a focus group or survey with Speech-Language Pathologists to see how themes found in this study compare with what they say the impact of music is on children with complex communication needs and ASD. Also, an intervention study could be done in order to enhance Music Therapist and Speech-Language Pathologist collaboration. Redesigning AAC interfaces for increased musical expression is also one area that could originate from this study. Finally, quantitative studies could be done in order to show the neurological and motivational impact of music on children with ASD.

**Conclusion**

The question of why music has a benefit for children with ASD who require AAC has no answer. There was no doubt that the participants in the current study endorsed the benefits of music for children with ASD. Although it will most likely take a constellation of evidence to support and explain the efficacy of Music Therapy with this population, gathering information from the individuals who see the benefits on a daily basis is an important start.
References


Appendix A

Research Questions

1. What are the benefits of using music to help non-speaking children with autism spectrum disorders (ASDs) to meet their communication goals?

2. What are the challenges of using music to help non-speaking children with autism spectrum disorders (ASDs) to meet their communication goals?

3. How would you advocate for Music Therapy to a health care professional in explaining why music might help children with autism spectrum disorders (ASDs) communicate better?

4. How do you document and/or measure changes in communication that occur during Music Therapy with non-speaking children who have autism spectrum disorders (ASDs)?

5. Discuss your experiences with augmentative and alternative communication systems when working with children with autism spectrum disorders (ASDs) and the role these systems played in your therapy. Why did it play the role or roles that you mentioned?

6. What advice do you have for speech-language pathologists when it comes to incorporating music into therapy sessions with children with autism spectrum disorders (ASDs) in order to help a carryover effect from Music Therapy? For example, how can they get started and continue working towards using music in their
sessions once a child has responded to it during Music Therapy, assuming there is collaboration happening between the Speech-Language Pathologists and a Music Therapist?
Appendix B
Ohio University Consent Form

Title of Research: A Focus Group With Music Therapists Who Work With Non-speaking Children Who Have Autism Spectrum Disorders

Researchers:
Kristin Abram, Undergraduate Student, Communication Sciences & Disorders, School of Rehabilitation and Communication Sciences
Dr. John McCarthy, Associate Professor, Communication Sciences & Disorders, School of Rehabilitation and Communication Sciences

You are being asked to participate in research. For you to be able to decide whether you want to participate in this project, you should understand what the project is about, as well as the possible risks and benefits in order to make an informed decision. This process is known as informed consent. This form describes the purpose, procedures, possible benefits, and risks. It also explains how your personal information will be used and protected. Once you have read this form and your questions about the study are answered, you will be asked to sign it. This will allow your participation in this study. You should receive a copy of this document to take with you.

Explanation of Study

This study is being done to determine what impact music has on the communication skills of children with autism spectrum disorders as well to provide information to speech-language pathologists of how to incorporate music into therapeutic sessions.

If you agree to participate, you will be asked to complete a demographic and screening questionnaire through a secure online site. If you meet all inclusionary criteria for this study, you will be invited to participate in online focus group discussions where you will be given an opportunity to contribute your views and ideas to clinically relevant questions. In the event that more than 10 music therapists respond who meet all of the inclusion criteria, the
10 individuals determined by the pre-screening to have the highest expertise and competence will be asked to participate in the focus group. If more than 10 individuals have the same level of expertise and competence, the final 10 participants will be chosen randomly.

**You should not participate in this study if:**

- You are not currently involved in providing direct intervention services to an individual who is a non-verbal child (from birth to age 21) with an autism spectrum disorder.
- You are not a certified music therapist with at least 5 years' experience.
- You have no experience in augmentative and alternative communication.

Your participation in the study will last approximately 6 weeks. If you choose to participate, you will spend approximately ten to twelve (10 to 12) hours answering and discussing questions for the entire study. You will be required to send back the signed consent form within one week by email. If you agree to participate in this study, you will be given one week to complete an online questionnaire prior to participating in the focus group. One question will be posted each week and you will be able to see the question along with the responses of the other participants in order to stimulate conversation. You may offer as many responses to the question and others’ responses as you would like. Participation each week is likely to require 1-2 hours of time. The focus group is estimated to extend for 6 to 7 weeks.

**Risks and Discomforts**

No risks or discomforts are anticipated in this study beyond those associated with computer use in daily life.

**Benefits**

This study is important to science/society because it will provide information about why music has a beneficial effect on the communication skills of children with autism spectrum disorders. The results of this investigation will provide a better understanding of why these benefits
occur and more information for speech-language pathologists on how they can incorporate music into their therapeutic sessions.

Individually, you will have the opportunity to address and discuss clinically relevant questions and issues regarding music therapy and the benefits and challenges it has on the communication skills of children with autism spectrum disorders. The online focus group will also provide an opportunity for you to interact with other professionals in the same field in a convenient setting.

Confidentiality and Records
Due to the nature of the focus group, all participants will have access to the raw data. All raw data, i.e. participants’ responses, will be removed from view to the participants from the online focus group at the end of each week and all data will be removed from view at the end of the final week. If you agree to participate in the study, you will be asked to complete a screening and demographic questionnaire. The researchers will provide you with login information to a secure online site and a numeric code will be assigned to each questionnaire. The master code list which matches the participants with the numeric codes can only be accessed by the research team and will be kept confidential. The focus group discussions will also be held online on a secure server that will be set up through the Office of Information Technology (OIT) at Ohio University. To participate in the online focus group discussions you will be required to login to the password protected site. In the focus group discussions, you can identify yourself using your first name or by a pseudonym. When discussing about specific clients or clinical experiences, please do not reveal any confidential information.

Additionally, while every effort will be made to keep your study-related information confidential, there may be circumstances where this information must be shared with:

* Federal agencies, for example the Office of Human Research Protections, whose responsibility is to protect human subjects in research;

* Representatives of Ohio University (OU), including the Institutional Review Board, a committee that oversees the research at OU;
personnel from the OIT at OU who retain the administrative rights for management and maintenance of the online server.

**Compensation**
As compensation for your time/effort, you will receive sixty dollars ($60) for completing all the focus group discussions. You will receive ten dollars after the first week, and again after the third week. If you complete all six focus group discussions, you will then receive the remaining forty dollars, for a total of sixty dollars. If you choose to discontinue from the study, you will retain the amount that was paid in appreciation for your participation and time.

**Contact Information**
If you have any questions regarding this study, please contact

Kristin Abram
Kc158209@ohio.edu
740-605-2316

Advisor
Dr. John McCarthy
mccarthyj@ohio.edu
740-597-1764

If you have any questions regarding your rights as a research participant, please contact Jo Ellen Sherow, Director of Research Compliance, Ohio University, (740)593-0664.

By signing below, you are agreeing that:

- you have read this consent form (or it has been read to you) and have been given the opportunity to ask questions and have them answered
- you have been informed of potential risks and they have been explained to your satisfaction.
- you understand Ohio University has no funds set aside for any injuries you might receive as a result of participating in this study
- you are 18 years of age or older
• your participation in this research is completely voluntary
• you may leave the study at any time. If you decide to stop participating in the study, there will be no penalty to you and you will not lose any benefits to which you are otherwise entitled.

Signature____________________________________ Date____
______________________________________________

Printed Name____________________________________

Version Date: [10/01/2013]

Preferred Email Address for Correspondence

I, ________________________________________, would like correspondence related to this study to be send to this email address

________________________________________

Signature

Date