Lesley University DigitalCommons@Lesley

Expressive Therapies Capstone Theses

Graduate School of Arts and Social Sciences (GSASS)

Spring 5-19-2018

Music Therapy Methods and Vocalizations: A Look into One Boy's Process

Brooke Rutstein Lesley University, rutstein@lesley.edu

Follow this and additional works at: https://digitalcommons.lesley.edu/expressive_theses

Part of the Social and Behavioral Sciences Commons

Recommended Citation

Rutstein, Brooke, "Music Therapy Methods and Vocalizations: A Look into One Boy's Process" (2018). *Expressive Therapies Capstone Theses.* 33. https://digitalcommons.lesley.edu/expressive_theses/33

This Thesis is brought to you for free and open access by the Graduate School of Arts and Social Sciences (GSASS) at DigitalCommons@Lesley. It has been accepted for inclusion in Expressive Therapies Capstone Theses by an authorized administrator of DigitalCommons@Lesley. For more information, please contact digitalcommons@lesley.edu, cvrattos@lesley.edu.

Music Therapy Methods and Vocalization: A Look into One Boy's Process

Capstone Thesis

Lesley University

April 9th, 2018

Brooke Rutstein

Music Therapy

Donna Owens

Abstract

This capstone thesis project explores a detail-oriented music therapy approach used to elicit vocalizations and speech for an individual on the autism spectrum. Although there is compelling research on music therapy contributing to speech acquisition for individuals with autism spectrum disorder (ASD), the methods discussed in the literature are vague and do not discuss the music itself in detail. Specifics would be helpful in order to allow these methods to be replicable. To explore specific musical elements, I administered five 30-minute music therapy sessions to a 12-year-old boy on the autism spectrum during his school day. During sessions, I measured vocalizations and intelligible speech within three distinct interventions: preferred song choices, vocal exercises, and client-led improvisation. Client-led improvisation produced not only the most overall vocalizations, but also the most intelligible words spoken by the client in comparison to the other categories studied. This thesis concludes with a discussion of how this method compares to the use of client-preferred songs and further applications for this intervention method and path of inquiry.

Keywords: music therapy, autism, speech production

Music Therapy Methods and Vocalization: A Look into One Boy's Process

In August 2017, CNN published an article titled, "Study Casts Doubt on Music Therapy for Kids with Autism" (Scutti). The study in question found that there was no difference in the changes in severity of symptoms between a group of children on the autism spectrum that had music therapy and standard care, and a group that only had standard care services. The study cited claimed to be seeking "real world" (p. 14) effectiveness between therapist-led improvisational music therapy and standard care, which included speech and language therapy, communication training, and sensory-motor therapy. They found that both groups yielded the same results, and that the effectiveness of both therapies was small overall.

This article (Scutti, 2017) may seem to discount music therapy as a viable option for speech therapy in children with autism in general, however, the beginning and end of the article profile a man that has benefitted from music therapy named Ethan Jones. Jones had participated in music therapy from a very young age because of his early autism spectrum disorder (ASD) diagnosis. According to Jones and his mother, he could "sing before he could speak" and it was "singing that led him into speech" through the guidance of a licensed music therapist (p. 7). The article's title claims to debunk music therapy as a realistic option for children with autism, but their profile on Jones shows the opposite. Both results discussed in this article exist, and this contradiction highlights a fundamental flaw within the research on music therapy with children on the autism spectrum.

The term *music therapy* has many colloquial definitions. According to the American Music Therapy Association (2018), 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" (p. 1). This

definition is used to encompass a wide variety of interventions deliberately. In the clinical sphere, licensed music therapists deserve to have the freedom to practice how they wish. This broad definition and vagueness of application, however, has led to broadness and vagueness within the research sphere of music therapy. One example of vagueness can be seen in Amy Kalas' (2012) research on autistic children's responses to simple and complex music. Kalas' definition of simple music is very clearly laid out, and musical examples are embedded within the article. The definition of complex music, however, is unclear, has no musical examples included or notated, and incorporates programmed songs on a type of keyboard that was never specified, making the musical examples impossible to replicate (pp. 434-436). Although she asserts that simple music was more engaging for children with lower functioning ASD, and complex music was more engaging for higher-functioning children, there is no way of knowing if simple and complex music can be differentiated within this study because of how obscured the definition of complex music is. This is one example of many music therapy articles that discuss music used without providing any concrete examples (Knight & Rabon, 2017; Edgerton, 1994; Raichel & Eilat, 2016).

In my exploration, I analyzed specific elements within music to see if a more detailed approach may provide greater insight into the successes and challenges in the music therapy process. I observed one individual's vocal responses and tendencies within music therapy sessions during three intervention types: client-preferred songs, vocal exercises, and client-led music improvisation. In doing so, I noted not only what interventions help him vocalize, but also what specific notes he gravitated towards vocalizing and when his speech was most intelligible. Because of the lack of descriptive observations, music therapy research is not always treated with the same respect as disciplines that are more quantifiable. I posited that music therapy can

Running head: MUSIC THERAPY METHODS AND VOCALIZATIONS

be quantifiable in ways that are meant to both validate the field to the public, and help practicing clinicians further their craft. Through this project, I aimed to discriminate the usefulness of three music therapy interventions as they relate to vocalizations and speech for my specific client. I observed if patterns emerged and explored the possible applications of each intervention as they relate to vocalization and speech for children on the autism spectrum.

Literature Review

This capstone thesis project explores one participant's process within music therapy through the use of three distinct interventions. The aim is to understand which intervention elicits the most vocalizations as well as the greatest instances of intelligible speech for a client that has limited verbal skills. In order to understand how my client responds to music, it is helpful to review how music therapy is already implemented for children with autism spectrum disorder (ASD). Also, because I am looking at his vocalizations and speech, it is important to look at how music therapy is used for speech production, both in general and within the ASD population. To further understand possible results, I review how individuals with autism process and respond to music.

Autism and Music Therapy

Studies that discuss music therapy and autism are observing phenomena in two main categories: social and behavioral. In the social category, ASD is viewed as a set of differences that may or may not be accepted by the neurotypical society, rather than a set of problematic behaviors. Michael Bakan's (2014) work, as an ethnomusicologist studying an inclusive choir, takes this social approach. He argues that inclusive groups for individuals with and without autism should be focusing less on autism awareness and more on acceptance. He came to this realization by observing an inclusive choir called ARTISM (Autism: Responding together in sound and movement). Through his observations of this group, he realizes that autism should be viewed as a different culture with a set of different cultural norms that are not any better or lesser than the dominant culture. His work also points out how individuals on the spectrum may have heightened talents and abilities in areas like music that should be fostered rather than focusing on the individual's deficits.

6

Nirit Raichel and Yael Eilat (2016) also took a social approach when researching the effects of an inclusive choir (with both children with ASD and typical children) in Israel. Their main motives for studying the choir were to address social and communal goals by observing if singing together would foster community, and if singing itself may ease the tensions around children with differing abilities interacting with one another. They found there was an increase in social interactions among the kids, and that all the children were able to connect further with their Israeli heritage. Through interviews, they also found that children on the spectrum increased their language skills through their involvement with the choir. Despite these findings, it is unclear what aspect of the choir experience actually increased the language skills. It may have been singing easy-to-learn songs (they did not include a list of songs), it may have been the act of singing itself unrelated to the specific songs, or it may have been the opportunity to socialize with peers in this space and may not have been related to the music at all. My exploration aims to clarify some of the uncertainties around their observations on singing and language.

Both studies discussed above advocate for the social benefits of singing for children with ASD, but do not discuss behavioral benefits. Although Raichel and Eilat (2016) discuss an increase in language skills, they do not detail any specific skills acquired. This may be because there is a gap in the research that links singing to behavioral outcomes. Music therapy and singing have, however, been studied in more detail with other populations.

Music Therapy and Speech

In order to understand how music therapy speech protocols may be implemented with children on the autism spectrum, the success may be viewed in the context of working with other neurologic deficits. Eri Haneishi's (2001) research uses the Music Therapy Voice Protocol (MTVP) technique to see if there are any vocal changes in individuals with Parkinson's disease. An example of one session using MTVP consists of an opening conversation, a facial/breathing warm-up, vocal exercises, singing exercises, speech exercises and a closing conversation. Haneishi found that the participants' vocal intensity and speech intelligibility increased, and moods improved as well. Although not statistically significant, the participants' vocal ranges increased by four notes on average. Haneishi admitted that the sample size used in this study is small, so the findings are not particularly generalizable, but this study lays the groundwork for the potential to use MTVP with individuals with Parkinson's to improve speech intelligibility and strength. I believe that there is potential to use a similar method for children with ASD.

There have also been studies that look at early childhood populations and language because early childhood is when language is acquired developmentally. Andrew Knight and Paige Rabon (2017) reviewed research in and out of the music therapy domain that pertained to speech and language. Their paper reviewed research on children with specific language impairments conducted by music therapists and non-music therapists through a developmental and neurological framework. One music therapy study addressed how music perception skills may be correlated with speech acquisition. Although they discussed language impairment and music, there was no discussion of the specific musical elements used to obtain these results.

A music therapy technique called Melodic Intonation Therapy (MIT) is used frequently to treat individuals with aphasia, stroke patients, and those what traumatic brain injuries (Norton et al., 2009). This intervention has clients intone (or sing) simple 2-3 syllable phrases, using two notes, and pairs the notes with a hand-tapping motion. Eventually, the pitches become less emphasized so that the phrases turn into speech-like utterances. Although this technique has been shown to be effective for neurologic disorders in adults, there is very little evidence on this being used with children at all, let alone children on the autism spectrum. Similar interventions may be fruitful for children with ASD since this method stems from a neurologic framework and ASD is a neurologic condition. A few similar protocols have been developed (Wan et al., 2011), but more generalized interventions are still most typically seen.

Music Therapy, Speech, and Autism

Cindy Lu Edgerton's (1994) study on music therapy improvisation with children on the autism spectrum is a good example of how speech production and vocal production is being studied in regards to this population. Her methods, however, are not written out in detail. She measured the communication behaviors of children with ASD before and after Nordoff-Robbins music therapy interventions. The Nordoff-Robbins method is a common music therapy technique in which the therapist improvises music based on what the client is doing in the moment. Of the 11 children with autism recruited, ages 6-9, five were considered nonverbal, and four had limited functional language skills. Communication behaviors were measured before and after the 10-week music therapy sessions with a checklist that was divided into musical and nonmusical responses. The overall scores on their scale for all subjects put together had an increase in responses from nine responses per session to 37. Their verbalizations also increased by one response on average. Although these are promising findings, this study is difficult to replicate given the vagueness of the methods used. Nordoff-Robbins music therapy relies on the creation of musical material based on input from the clients to create the musical space (p. 34). Edgerton's article, however, does not specify the musical material that was used to obtain increases in subject responses.

A neural imaging study (Lai et al., 2012) was completed based on the premise that individuals on the autism spectrum have an easier time singing than speaking. Lai, Pantazatos, Schneider, and Hirsch (2012) had children ages 5-18 on the autism spectrum, and neurotypical children ages 4-18, listen to speech and songs while in an fMRI machine. They found that neurotypical children had more brain activity when listening to speech, whereas children on the spectrum had more brain activity when listening to songs. Although this is a promising finding to support music therapy and the use of song to connect to individuals with ASD, the study is still lacking in musical data. The songs picked for the children to listen to were "selected as each child's favorite or preferred song containing vocals" (p. 963), while the speech samples were the same script read by the parents of each child to allow for familiarity. Outlining the specific examples of music used may have been useful to see their composition and complexity, because it is possible that there may have been concrete differences in the song preferences between the groups of children. Discrepancies or similarities in the musical components of the songs chosen between the groups may have provided more clarity into why these results were seen.

Within the literature, I have come across one music therapy intervention, in relation to ASD, that discusses specific musical material: Auditory-Motor Mapping Training (AMMT). AMMT is a music therapy method used to teach speech by associating phonemes with articulatory actions (Wan et al., 2011). Wan and colleagues (2011) used AMMT in a study with six children, ages 5-9, on the autism spectrum that were non-verbal. To map the notes to an action, the participants would sing the notes while tapping on a tuned drum. The researchers found that AMMT increased speech production in the participants on both trained and non-trained words and phrases. The children produced more phonemes, words, and phrases after the 40 sessions were completed, showing the range of what speech patterns this kind of music therapy intervention may affect. Although I will not be using this specific approach, I will be using the AMMT framework as a precedent for what I am exploring.

Aside from AMMT, there is very little evidence of pairing specific notes with vocalizations in the ASD population. Despite MIT being a very popular neurologic music therapy approach, it is not used specifically with nonverbal children on the spectrum. This is an oversight in the music therapy field because of the specific way that individuals with autism respond to music. Instead of using full songs as interventions, it may be more fruitful to parse songs into smaller musical elements. This may aid in music therapy's effectiveness because individuals on the autism spectrum may have what is referred to as "local coherence" (Foxton, 2003).

Autism and Local Coherence

Through various studies on autism and the brain, researchers have found that one common feature individuals on the autism spectrum share is the processing of music through parts rather than processing the entire piece as a singular entity (Foxton, 2003). This concept is called local coherence, which is contrasted with global coherence (how neurotypical individuals process music). Examples of local features of music are contours of the melody, absolute pitches, and isolated harmonic information such as chords. Global features are the entire melody, entire harmonic structure, or the song as a whole (p. 2704). In earlier studies, local coherence was referred to as "weak central coherence" (Mottron et al., 2000, p. 1058) because it was perceived as a negative attribute and researchers suspected that autistic individuals did not have the capacity to comprehend the perceptual whole. However, subsequent research by Rhonda Booth and Francesca Happé (2010) found that local coherence is a bias rather than an inability to globally process music. Booth and Happé discovered, through the use of a Sentence Completion Task, that local coherence is a cognitive style preference and not an inability to

process global concepts. This bias may help rather than hinder the musical abilities of individuals on the autism spectrum.

There are also individual case studies that allude to a preference in individuals on the autism spectrum for some musical notes over others. Dorita Berger (2002), a certified music therapist, worked with a child named Randy, who always hummed when he walked down hallways (p. 23). Berger noticed that when Randy hummed, it was always either a middle C (C4) or B3 (the note directly below C4). Those specific notes are what comforted him while others did not produce the same comforting effect. When Randy was taught to hum and play those notes on the kazoo in private music therapy sessions and practiced walking to and from places more efficiently and comfortably, his humming while walking stopped without specific condemnation of the act itself.

Instead of seeking out individuals that were struggling, Joseph Straus (2011) interviewed and studied musicians on the autism spectrum that were very successful. One of the musicians on whom he focused was Glen Gould. Gould is regarded as one of the greatest pianists of the twentieth century. His recordings are still in demand today and he was well-known for the clarity of his playing; he was also known for his eccentricities. He sang and hummed during every performance and was disengaged from social behavior. Straus (2011) and other historians believe these behaviors indicate he may have been an autistic savant (p. 137). Aside from his behavioral quirks, Gould also reported a preference for extreme isolation of individual tones. This fact about him supports the idea that autistic individuals have preference for musical local coherence. Although this feature may not be present in every single individual on the spectrum, it is possible that those who are drawn specifically to music may also be drawn to local features. Despite this knowledge that autistic individuals may have a preference for smaller elements of music over larger structures of music, such as songs, songs are the center of almost every intervention with this population (*How to pick out the best music for your special needs child*, 2015). In my capstone research, I aim to see if one individual shows preferences for specific notes within song interventions, as well as interventions that focus more on local features of music, such as vocal exercises and improvisations.

Methods

In order to determine which music therapy interventions elicited the most vocalizations and speech, I worked with one student weekly using various methods. Before beginning a structured analysis of music therapy sessions, I met with the student a few times in order for him to become familiar with me. After the participant and I became comfortable around each other in individual music therapy sessions, I recorded five sessions for this project.

Project Design

For my capstone thesis project, I chose the option that allowed me to administer a new method within the music therapy modality. In order to administer a set of music therapy interventions, I first checked with my internship site to make sure they allowed recordings and observations of students. I was given permission by the school and the client's family to record and analyze his music therapy sessions. At my internship, I was allowed to choose the individual I wanted to work with weekly and was allotted a 30-minute timeslot in which I was to work with this student. I designed my methodology with these parameters in mind.

After gaining permission to work with a participant and solidifying the ritual of meeting each week, I designed a set of interventions that would engage this specific individual during our half-hour sessions. I met and recorded five music therapy sessions at the same time and in the same place each week. We always sat in the same chairs, and had the chairs facing in a consistent direction towards one another. Instruments were always to my left and his right. *Song Choice* cards were hidden underneath my guitar case, in order to not be distracting, until they were needed for a specific activity. I walked the participant to and from his classroom, and we were always the only two individuals in our session space.

Participant

In order to keep the analysis focused, precise, and detailed, I only had one participant in my exploration. The individual was a 12-year-old boy on the autism spectrum. He attended a school program specifically for children with autism and developmental disabilities. He showed an affinity for music and a motivation to sing prior to his involvement in individual music therapy sessions. In his free time during the school day, he would listen to music videos on YouTube and vocalize while listening and watching. Most of his observed vocalizations prior to individual music therapy sessions were in his falsetto range (the upper register of his voice). When he spoke in that register, it was difficult for other individuals to understand him. He was an ideal candidate for music therapy interventions because he was musically motivated yet had observable speech difficulties. His teacher and his guardians agreed that music therapy would be beneficial for him, so we began our work together. My methods were then molded to fit his specific needs and deficits.

Intervention

Each session adhered to the same format to allow for consistency for my participant and to control as many variables as possible. First, I played a *Hello Song* that I had written which incorporated vocal exercises, as well as the participant's name and an easy-to-learn melody. Then, the client was given a *song choice*, which was an opportunity for him to pick a song that he liked. The specific choices presented to him were based on a previously determined list of song preferences. To simplify the process and to set him up for success, he was given a choice between two preferred songs, which were offered using visual aids. After the first client-preferred song, we sang simplistic vocal exercises. Vocal exercises were meant to last for a few minutes at least, but my client showed little interest in vocal exercises, so this intervention

flowed into client-led free improvisation on various instruments. He was able to sustain his attention and interest longer in this activity. We used the guitar, a piano app (Virtuoso), a drum beat app (DrumPad 24), an ocean drum, a cabasa, bongo drums, and a cappella singing during times of client-led improvisation. Then, the participant would make another song choice, we would sing either vocal exercises or improvise on a different instrument (depending on the participation level within vocal exercises), and we would close the sessions with a familiar *Goodbye Song*. The *Goodbye Song* used in these sessions is one utilized by the hired music therapist on-site, so he had been exposed to this song for years before we started working together. As such, I considered the Goodbye Song a familiar song to the client.

I chose to do these specific interventions in order to compare and contrast verbalizations and intelligible speech both within and across sessions. There are two instances of clientpreferred songs, vocal exercises, and client-led improvisation during each session in order to control for the ordering of interventions influencing vocalizations. A Hello song and Goodbye song were used to concretely begin and end each music therapy session. Client-preferred songs were used because most music therapy interventions that have speech as a goal utilize familiar songs to try and get participants to sing along. This method is the most commonly found in the literature on clinical practice (*How to pick out the best music for your special needs child*, 2015). Vocal exercises were used because they addressed this participant's specific goal towards increasing his vocal range. Because his speech in his upper register is not as intelligible as his lower voice, vocal exercises were implemented to see if, after they were sung, his speech may be lower pitched and easier to understand. Client-led free improvisation was used as an intervention for a few reasons. First, client-led improvisation is not seen as often in the literature as clinician-led improvisation when discussing the actual music being produced in a given music therapy session. I define client-led improvisation as situations in which the client is putting forth and creating the musical material to be expanded upon. In clinician-led improvisation, such as the Nordoff-Robbins method, the clinician will improvise full songs based on either the client's movements or vocalizations. According to the Nordoff-Robbins Institute at New York University, "the practice is both artistic and scientific: artistic in the creativity and aesthetic sensitivity with which therapists create music to meet individual client needs" (*Nordoff-Robbins music therapy*, 2018, p. 3). The Nordoff-Robbins method of music therapy has many merits but it may or may not lend itself specifically to client vocalizations and speech, because the practice encourages the therapist to shape the music-making rather than allowing the client to be an active member in the process.

Although the original intent was to provide more time for vocal exercises than free improvisation, the client showed more interest and attentiveness during improvisations. Therefore, the original methodology was adapted to allow for the most success for this particular participant.

Analysis

I audio-recorded each session to have the raw data readily accessible for my exploration. I analyzed the recordings by listening to them in their entireties while documenting any distinct vocalization and intelligible words. I chose to define a distinct vocalization as "an utterance with a clear beginning and ending" rather than as a pitch change. I also noted whether that vocalization or word occurred during the Hello song, a client-preferred song, a vocal exercise, a client-led improvisation, or in a non-musical space in between interventions.

I also observed the overall pitch range of the client, and if there were any notes that he preferences while singing and speaking more than others. To assess this, I used the Transcribe!

Running head: MUSIC THERAPY METHODS AND VOCALIZATIONS

music analysis software (Seventh String Software) to find out which pitches were being sung and spoken by my client, and then recorded the frequency of each note within the same five domains as the distinct vocalizations. I used the the recording of distinct pitches to observe if any changes occurred over time from the first session to the fifth session. I observed if the vocal range had expanded, if the lower register had strengthened, if higher notes were further reinforced through music, or if no changes occurred.

Finally, I looked at my own expectations of what I predicted would occur against what actually came about within these music therapy sessions. I noted times when I was surprised by my results and if there were any trends that emerged that may be beneficial to the field at large.

Results

For my capstone thesis, I worked individually with a 12-year-old boy on the autism spectrum in five music therapy sessions. Each session adhered to a specific structure, using three different interventions in order to see which intervention led to the most vocalizations and intelligible words for my client. I observed whether any one intervention was more effective than others at eliciting these responses.

Data Analysis

Upon reviewing each music therapy session and recording distinct vocalizations, I found that the majority of vocalizations were produced during client-led free improvisation, as shown in Figure 1. This was determined by looking at the total vocalizations within each of the five categories: 1. The Hello Song, 2. Client-Preferred Songs, 3. Vocal Exercises, 4. Client-Led Improvisations, and 5. Non-Music Space. Client-led improvisations led to the most vocalizations in three out of the five sessions overall, one session had the most distinct vocalizations in the client-preferred songs category, and one session had the most vocalizations during the non-music space.



Figure 1. Total Vocalizations per Intervention

Figure 1 shows that client-led improvisation led to the most distinct vocalizations across all five sessions, followed by the non-music space, client-preferred songs, the Hello Song, and then vocal exercises respectively. I found it very surprising that non-music space would lead to as much vocal activity as it did, since there was nothing prompting my client to sing or speak during this time. The low numbers in the Hello Song are to be expected because that song only takes up two minutes of any given session at most. The low number of vocalizations in the vocal exercises category, although not predicted initially, were also to be expected as vocal exercises also did not take up any longer than a minute or two in any given session.

When looking at the specific notes vocalized, the participant had a larger vocal range than I initially anticipated, as shown in Figure 2. There is, however, still a slight preference for the notes in his upper register. His greatest note of preference is G4, which is the lower end of his falsetto range, but is still past his vocal break from his chest voice into his head voice.



Figure 2. Total Vocalizations by Note

The second most-vocalized note is D#4, which is a note he only vocalized while perseverating on a specific melody. This melody was: F4 - D#4 - D#4 - C#4 - D#4. He sang this melody many times during the non-musical space within sessions. Because of this perseveration, it is hard to tell whether those notes themselves are preferred, or if he was

repeating the melody in its original key. I do not know the source material for this melody, so I cannot determine if he transposed it or not.

Because of the fixation on this melody, the data may be more reliable with an omission of the D#4. In this case, the three most-vocalized notes are G4, A4, and B4 respectively. This would support the idea that he is more comfortable in the upper register of his voice, which is something I initially observed about this client. When the D#4 is taken out of all sessions, there is also a trend showing that his vocal range becomes lower and more expanded in Session 4 and Session 5 when compared to previous sessions (seen in Appendix A).

The other factor being observed in my exploration is how many intelligible words he said during each music therapy session, and during which intervention they were said.

Table 1

Words Spoken:	Songs	Vocal Exercises	Improvisations	Hello Song	Other	Totals:
Session 1	0	1	6	3	0	10
Session 2	8	1	1	0	6	16
Session 3	4	3	8	3	6	24
Session 4	3	0	7	1	1	12
Session 5	8	0	8	0	15	31
Totals:	23	5	30	7	28	

Intelligible Words by Session and Intervention

Table 1 shows that the times in which the most intelligible words were spoken correlated with the music interventions that produced the most overall vocalizations. He not only vocalized the most during client-led improvisation, but also spoke the most. This chart also shows that he spoke more intelligibly in later sessions as compared to earlier sessions. Because the analysis was done after all of the sessions were completed, I was not biased toward finding him unintelligible near the beginning of the process. I had spent many hours with the client before this coding was completed, so I had a solid grasp on his speech patterns.

Overall, these results show that my client was motivated by client-led improvisation to sing and speak. He preferred his higher range throughout the process, but began to expand his vocal range as the weeks went on. He also spoke more, in improvisation and in total, as the weeks progressed.

Expectations vs. Reality

I initially went into this thesis project with the intent on focusing on vocal exercises and if they had the ability to elicit vocalizations and speech from my client. However, as a clinician in this setting, I wanted to best serve my client in the times that we spent together. I quickly learned that he was more willing to engage in the music therapy process through improvisation as opposed to vocal exercises, so I modified my model to shorten the vocal exercise portion of the session and increase the time for client-led improvisation. Although I decreased the portion of time spent on vocal exercises, I still spent an equal amount of time playing client-preferred songs and allowing for improvisation. Despite knowing that he liked to vocalize, I did not anticipate him being so motivated by the freedom that is allowed when I stepped back to create more silence and open space for him to participate.

After adjusting my model, I tried to go in with an open mind in order to explore which music therapy interventions would appeal to him the most. I suspected, however, that music improvisation would be very motivating, but that client-preferred songs would be equally as motivating. Discourse about how to use music therapy with pre-verbal and non-verbal populations led me to believe that client-preferred songs are the most motivating tool for connecting with a client (*How to pick out the best music for your special needs child*, 2015). I found, however, that leaving open space between interventions, the non-music space, was more motivating for my individual client than his preferred songs. He would get very excited when I

played a song that he chose, as shown by his facial expressions, but he did not match that excitement by singing along. Instead, he silently listened to me play even when I would leave space for him to fill in the lyrics. This finding contradicts the clinical assumptions about music therapy and ASD.

Live Perceptions vs. Recorded Data

During the initial sessions, I was very focused on the high-pitched timbre in his voice. I thought that he was stuck in that vocal register and that he would have a very difficult time vocalizing lower notes. Even when he would vocalize lower notes, I did not view that as an authentic expression, but as more of a fluke because his voice would quickly jump back up. When listening to his recordings, however, I could hear that there was a greater balance in his vocal range than what I had experienced in his presence. I was also surprised to learn from the recordings that there has been longitudinal progress in both his vocal range and his intelligible speech. Although I was present in these sessions and could hear him vocalizing and speaking, I did not realize that these lower vocalizations or word count had increased over the course of our time together.

As discussed, I was surprised to learn, upon analysis, that there were few vocalizations during client-preferred songs. When in the sessions, I could see his excited and enthusiastic facial expressions when he chose a song for me to play. He would smile and bounce during his favorite songs, but did not vocalize. These qualitative visual observations are lost in the audio recording analysis, and the vocalization numbers may be wrongly interpreted as him being disinterested in songs. He was very interested in these songs and enjoyed listening to them, but they were not motivational tools for singing and speaking.

Summary

I found trends in the data from these interventions that surprised me. I hoped that my client's range would expand through the help of music therapy. His overall range was consistent from the beginning, so it did not expand (in a way that I can determine definitively), but he did use his lower range more frequently in later sessions when compared to earlier ones. This may be due to factors related to music therapy, a specific intervention, or simply the fact that he began to feel more comfortable with me as time went on. I was also able to observe that client-led improvisation led to the most client participation. Not every client enjoys taking the lead in a musical experience, but this client in particular was more engaged when he was able to control the music within sessions. This finding is fairly different from what music therapists commonly rely on for vocal production (Edgerton, 1994; *How to pick out the best music for your special needs child*, 2015). He also produced more words as the sessions went on, and produced the most words in client-led improvisation overall. My findings in these areas are positive and can possibly support the benefits of music therapy, although there are external factors that may have contributed to these results.

Discussion

After listening back to all of the sessions, I found that my client sang the most during client-led improvisations, and also had the most intelligible words spoken during that intervention. I entered this project knowing that I wanted to see if interventions other than client-preferred songs could be used for vocalization and speech, but I was not sure which intervention would be the most fruitful. By completing this process, I have observed promising benefits of using client-led improvisation for not only client enjoyment and autonomy, but for speech and language goals for children with ASD.

Predictions vs. Reality

Before beginning this project, I had assumptions that music therapists over-rely on clientpreferred songs as an activity for speech production, but I was unaware of what could replace that intervention for children with ASD. Given the literature on local preference for those clients (Booth & Happé, 2010; Foxton, 2003), I wanted to see if parsing down music intervention into smaller musical moments through vocal exercises or client-led improvisation would lead to more vocal freedom and expression for the clients. I speculated that vocal exercises would be most useful for a general client, but that client-led improvisation may produce an increase in vocalizations as well. Although my client did not enjoy vocal exercises, he was very drawn to client-led improvisation and was most engaged and vocal during that intervention.

I believe my original prediction may have been misguided because of my client's overall functioning level. He loves music and will listen and sing without prompting, but did not quite understand the direct prompts I was giving him to sing during vocal exercises. I think that, if he had been higher functioning, the vocal exercises might have produced different results. However, I still feel that his excitement and engagement in client-led improvisation highlights some of my original query that a new methodology around music therapy interventions for speech and ASD may be needed. He had more vocal participation between interventions than during client-preferred songs, which supports the idea that clients need space and autonomy in order to achieve their goals in this setting.

Unforeseen Challenges

When I first formulated my methodology, I divided my sessions into three activities: client-preferred songs, vocal exercises, and client-led improvisation. Upon analyzing my data, however, I realized that there are other parts of a typical music therapy session that don't fall neatly into those three categories. The first issue was the Hello Song I used in each session. I composed the song and purposefully added vocal exercises and a large range within the song to prime my client for vocalization, but because I used it every week, it may also be categorized as a preferred or familiar song. I decided to analyze this portion of the sessions separately because it did not fit neatly into the vocal exercises category or the song category although it incorporated features of both. The Goodbye Song that I used, however, is one that his school's music therapist has been singing him for years, so I considered that song a client-preferred song when analyzing my sessions. I also was not sure how to analyze the space in between interventions, so I analyzed the vocalizations during that time as separate from any other category. These distinctions helped me to organize my data, but did not contribute to understanding specific intervention successes because these vocalizations were detached from any one intervention.

Another challenge that arose was the lack of consistency in the song choices and clientled improvisation in terms of how long each activity was completed. In some sessions, we sang many client-preferred songs that were short, wherein others we sang two or three longer songs. In some sessions, he was very engaged in his own vocal improvisations, so I allowed him to sing as long as he wanted to before moving on to another activity. I hoped that, because I am looking at five sessions rather than one in this exploration, the inconsistencies in time spent in each activity would even out across the sessions. Therefore, although it was a challenge, I believe that my conclusions can still be considered reliable in regards to this client.

Successes and Shortcomings

Because this thesis was conducted using a music therapy client, he had many successes within this exploration, but there were also parts of the study itself that did not follow the exact protocol due to the spontaneous nature of music therapy sessions.

The client I worked with was able to consistently use more of his range and to say more intelligible words after meeting with him for multiple sessions. He was able to use his time during client-led improvisation to express himself and feel validated and heard. In an ASD population, and especially with children on the lower end of functioning, they may be ignored when producing sounds that are not specifically speech. The interventions that I used allowed my client to feel heard and understood even when I did not understand the specific words he was trying to use. His affect and enthusiasm during his vocalizations suggested that he enjoyed our time together and the opportunities for him to sing while someone listened to him. He came to the sessions eagerly and consistently every week, and was alert and present for every meeting.

Some difficulties with this client arose when I had to decide between operating according to clinical best practices or sticking strictly to the methodology for my capstone project. If he was enthusiastic about a particular activity, I did not want to cut the activity short in order to proceed to the next item in my intervention protocol. I did incorporate client-preferred songs, vocal exercises, and client-led improvisation in every session, but the interventions did not always all get equal time because of my duties as a clinician. Also, during Session 2, I played a

client-preferred song from a recording rather than singing it live, which was not an intervention I planned to include in my methodology. However, my client had been perseverating on a particular melody, and I wanted to see if this recorded song was where the melody came from. Even after playing the recording, it was unclear if he was familiar with the song that had played. This uncertainty made it difficult for me to label the recording as a "client-preferred" song, but I did so because he seemed to enjoy the song even if he was not familiar with it prior to the session and it was a song composed by others that was utilized in the same way he listened to prior songs in previous sessions.

Generalizability

Although my findings were not what I had originally expected, they create the need for further exploration into the usefulness of these interventions within the non-verbal or limited verbal ASD population. The fact that client-led improvisation led to much more participation from my client is a finding that should be further explored. This study involved only one individual, but he is an individual that has typical tendencies for his diagnosis. He still enjoyed listening to his favorite songs, but provided the most singing and speaking when I, as the music therapist, stepped back and gave him space to produce sounds and words on his own. This is further supported by the fact that he had more vocalizations in between interventions, in the nonmusic space, as compared to client-preferred songs as well. This client preferred space and limited external stimuli to share his voice, and he may not be the only child on the autism spectrum to have that tendency. Further research would have to be done to know that this is generalizable to the ASD population, but these findings make it worth exploring.

Further Considerations

If I were to do this set of interventions either again or with more participants, I would change a few of my methods to allow for more consistency and validity. First, one measurement that I left out of my data collection was the specific instruments being used when client-led improvisation took place. It would have been interesting to see if any particular instruments elicited more vocal improvisation than others. Because I was not aware of any preferred instruments, I used many different kinds. I wish that I had been more consistent with which instruments I was using during this process, because it may have created more focused and generalizable results. I believe that having him sing while I played the guitar was the most consistently used method for client-led vocalization, where he would sing and I would support his melody on guitar, but that was not the only way that we explored the specific intervention. If I were doing this study with a group of participants instead of one individual, I would have made distinctions between client-led improvisation with just voice and guitar compared with client-led improvisation where the clients played instruments. Because my specific client was not very active on instruments and mostly relied on his voice for participation anyway, I do not believe that this distinction would make a large difference in these current findings, but would be imperative going forward with other participants.

I believe that this method works best as a set of sessions in order to measure longitudinal growth as well as the specific interventions as they are used with each client. The longitudinal approach is not something I would change if doing it with others, but I would make the sessions themselves follow a more structured formula that did not allow for as much variability among each meeting. I feel as though I did my best to stick to my intervention methodology while still

acting as a clinician. In the future, as a researcher, I would feel more comfortable conforming to a completely structured plan for each session if I were to complete a study like this again.

Conclusion

Through the capstone thesis project, I was able to practice research skills that may be useful when conducting research in the future. I was able to focus in on one client and, through an exploratory process, found interventions that allowed him to thrive and be his most expressive self. I also identified that client-preferred songs hindered his creative expression despite his enjoyment in the songs themselves.

My findings suggest that client-preferred songs, which are heavily used by music therapists, may provide too much external stimuli to allow for outward contributions from the client. Some clients are inclined to fill in words or notes when music therapists pause in a song, but even this may not be as compelling to sing as simply supplying a sparse musical space for vocal exploration. Further research is needed to support the findings of my work with one client, but my capstone thesis suggests that client-led free improvisation may be under-utilized when looking at music therapy, vocalization, and speech for children on the autism spectrum.

References

- American Music Therapy Association. (2018). *What is Music Therapy*? Retrieved from https://www.musictherapy.org/about/quotes/
- Bakan, M. B. (2014). Ethnomusicological perspectives on autism, neurodiversity, and music therapy. *Voices: A World Forum for Music Therapy*, 14(3).
 doi:10.15845/voices.v14i3.799
- Berger, D. S. (2008). *Music therapy, sensory integration, and the autistic child*. London: Jessica Kingsley.

Booth, R., & Happé, F. (2010). "Hunting with a knife... and fork": Examining central coherence in autism, attention deficit/hyperactivity disorder, and typical development with a linguistic task. *Journal of Experimental Child Psychology*, *107*(4), 377-393. doi:10.1016/j.jecp.2010.06.003

- Edgerton, C. L. (1994). The effect of improvisational music therapy on the communicative behaviors of autistic children. *Journal of Music Therapy*, XXXI(1), 31-62. doi:10.1093/jmt/31.1.31
- Foxton, J. M. (2003). Absence of auditory 'global interference' in autism. *Brain, 126*(12), 2703-2709. doi:10.1093/brain/awg274
- Haneishi, E. (2001). Effects of a music therapy voice protocol on speech intelligibility, vocal acoustic measures, and mood of individuals with Parkinson's disease. *Journal of Music Therapy, XXXVIII*(4), 273-290.
- How to pick out the best music for your special needs child. 20 Dec. 2015, www.musictherapykids.com/howtopickmusic/.

- Kalas, A. (2012). Joint attention responses of children with autism spectrum disorder to simple versus complex music. *Journal of Music Therapy*, *49*(4), 430-452.
 doi:10.1093/jmt/49.4.430
- Knight, A., & Rabon, P. (2017). Music for speech and language development in early childhood populations. *Music Therapy Perspectives*. doi:10.1093/mtp/mix0
- Lai, G., Pantazatos, S. P., Schneider, H., & Hirsch, J. (2012). Neural systems for speech and song in autism. *Brain*, 135(3), 961-975. doi:10.1093/brain/awr335
- Mottron, L., Peretz, I., & Ménard, E. (2000). Local and global processing of music in high-functioning persons with autism: Beyond central coherence? *Journal of Child Psychology and Psychiatry*, 41(8), 1057-1065. doi:10.1017/s0021963099006253
- Nordoff-Robbins music therapy. (2018). Retrieved from https://steinhardt.nyu.edu/music/nordoff/therapy/nordoff
- Norton, A., Zipse, L., Marchina, S., & Schlaug, G. (2009). Melodic Intonation Therapy: Shared insights on why it is done and how it may help. *Annals of the New York Academy of Sciences*, *1169*(1), 431-436. doi:10.1111/j.1749-6632.2009.04859.x
- Raichel, N., & Eilat, Y. (2016). An inclusive school choir for children with autism in Israel:
 Using grounded theory to explore the perceived benefits and challenges. *Voices: A World Forum for Music Therapy, 16*(1). doi:10.15845/voices.v16i1.849
- Scutti, S. (2017, August 08). Study casts doubt on music therapy for kids with autism. Retrieved from https://www.cnn.com/2017/08/08/health/autism-music-therapystudy/index.html
- Seventh String Software. (2018). Transcribe! (Version 8.71.0) [Computer software]. Retrieved from https://www.seventhstring.com/xscribe/overview.html

- Straus, J. N. (2011). *Extraordinary measures: Disability in music*. New York, NY: Oxford University Press.
- Wan, C. Y., Bazen, L., Baars, R., Libenson, A., Zipse, L., Zuk, J., ... Schlaug, G. (2011).
 Auditory-Motor Mapping Training as an intervention to facilitate speech output in non-verbal children with autism: A proof of concept study. *PLoS ONE*, *6*(9).
 doi:10.1371/journal.pone.0025505

Appendix A



Vocalizations by Note in Individual Sessions

Figure 3.A - Session 1 Note Vocalizations



Figure 4.A - Session 2 Note Vocalizations



Figure 5.A - Session 3 Note Vocalizations







Figure 7.A - Session 5 Note Vocalizations

Appendix B

Songs Used in Each Session

Session 1:

Dynamite

Cruz, T., Luke, Dr., Martin, M., Blanco, B., & McKee, B. (2009). Dynamite [Recorded by T. Cruz]. On*Rokstarr* [Digital download]. United Kingdom: Island Records. (May 30, 2010)

Twinkle Twinkle Little Star

Taylor, A. (1806). Twinkle twinkle little star.

Blue Suede Shoes

Blue suede shoes [Recorded by C. Perkins]. (1956). On *Honey don't* [Vinyl recording]. Memphis, TN. (1955, December 19)

"Goodbye Song" - Jessica Kaptcianos, MT-BC

Session 2:

Happy

Happy [Recorded by P. Williams]. (2013). On *Happy* [CD]. Miami: Pharrell Williams. (2013)

You Will Be Found

Pasek, B. (2017). You will be found. On *Dear Evan Hansen* [CD]. New York City. (2017)

Jingle Bell Rock

Beal, J., & Boothe, J. (1957). Jingle bell rock. On *Jingle bell rock* [Vinyl recording]. Sony Music. (1957, October)

Feliz Navidad

Feliciano, J. (1970). Feliz navidad. On Feliz navidad [CD]. RCA.

Rockin' Around the Christmas Tree

Marks, J. (1958). Rockin' around the Christmas tree [Recorded by B. Lee]. On *Papa noel* [Vinyl recording]. (1958, October 19)

Have Yourself a Merry Little Christmas

Have yourself a merry little Christmas [Recorded by J. Garland]. (1944). On *Meet me in St. Louis*.

Rudolph the Red-nosed Reindeer

Rudolph the red-nosed reindeer [Recorded by G. Autry]. (1949). On *It doesn't snow* on *Christmas* [Vinyl recording]. Columbia. (1949, June 27)

"Goodbye Song" - Jessica Kaptcianos, MT-BC

Session 3:

Rainbow Connection - Jim Henson

Williams, P. (1979). Rainbow connection [Recorded by K. Ascher]. On *The muppet Original soundtrack recording*. A&M Studios. (1978)

Jingle Bell Rock

Beal, J., & Boothe, J. (1957). Jingle bell rock. On *Jingle bell rock* [Vinyl recording]. Music. (1957, October)

Santa Claus is Coming to Town

Santa Claus is comin' to town [Recorded by E. Cantor]. (1937).

Jingle Bells

Pierpont, J. L. (1857). Jingle bells.

"Goodbye Song" - Jessica Kaptcianos, MT-BC

Session 4:

Let it Go

Anderson-Lopez, K., & Lopez, R. (2013). Let it go. On *Frozen* [CD]. Wonderland Music Company. (2013)

Can't Stop the Feeling

Can't stop the feeling [Recorded by J. Timberlake]. (2016). On *Trolls: Original motion picture soundtrack* [CD]. RCA.

"Goodbye Song" - Jessica Kaptcianos, MT-BC

Session 5:

Blue Suede Shoes

Blue suede shoes [Recorded by C. Perkins]. (1956). On *Honey don't* [Vinyl recordin Memphis, TN. (1955, December 19)

Old McDonald Had a Farm

Old MacDonald had a farm. (1917).

I'm a Believer

I'm a believer [Recorded by Smash Mouth]. (2001). On *I'm a believer* [CD]. Interscope.

"Goodbye Song" - Jessica Kaptcianos, MT-BC