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The Improvement of Verbal and Nonverbal Communication in a Teenage Male with Autism
Spectrum Disorder in Music Therapy: A Clinical Case Research Study

by

Kaitlin A. Pisarczyk

A thesis submitted in partial fulfillment of the requirement for the degree of
Master of Music Therapy

AUGSBURG UNIVERSITY
MINNEAPOLIS, MINNESOTA

2021

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MT AND COMMUNICATION IN AUTISM

MASTER OF MUSIC THERAPY

AUGSBURG UNIVERSITY

MINNEAPOLIS, MINNESOTA

CERTIFICATE OF APPROVAL

This is to certify that the Thesis of

has been approved as the thesis requirement for the degree of the

Master of Music Therapy

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Abstract

This study aims to investigate the impact of music therapy on nonverbal and verbal communication behaviors of a 13 year old male diagnosed with autism. A single-case study design was used, collecting both quantitative and qualitative data. Qualitative data included analysis of the clinician/ researcher's session notes and personal reflections over six months. Video recordings of three sessions in the last two months of the treatment were collected as quantitative data. The client's nonverbal and verbal behaviors in the recorded sessions were assessed by the clinician/researcher and her supervisor using an assessment tool designed by the researcher. Quantitative results indicated a distinct increase in the client's nonverbal and verbal behaviors over the course of eight weeks, which was corroborated by the qualitative analysis. Results suggest that music therapy positively impacted the client's nonverbal and verbal behavior by providing the client with ample opportunities to engage in non-invasive and client directed music experiences and promoted a positive therapeutic relationship with the researcher.

Keyword: music therapy, autism spectrum disorder, communication, nonverbal, verbal

Chapter 1

Introduction

The field of music therapy has a long history working with people with Autism Spectrum Disorder (ASD) since 1940 (Reschke-Hernandez, 2011). According to the AMTA's 2019 workforce analysis, 39.9% of music therapists reported working with clients with autism. Goals addressed in music therapy include increasing their communication, social, and emotional skills (Accordino et al., 2015; Reschke-Hernandez, 2011; Simpson & Keen, 2011). Recreative, such as signing preferred songs and playing musical instruments, and improvisational methods are commonly utilized with this clientele in order to accomplish these respective goals (Accordino et al., 2015; Reschke-Hernandez, 2011; Simpson & Keen, 2011). Research and current clinical practice also supports the use of the other two methods of music therapy, compositional and receptive, to accomplish the same goals (Kern et al., 2013; Reschke-Hernandez, 2011).

Many individuals with autism experience deficits in speech and communication. One area in particular children with ASD may experience difficulties is in expressive communication. The child may possess skills to vocally communicate with someone; however, they may lack the knowledge on how to correctly use their vocal skills to communicate with someone. Other children's verbal communication skills may develop typically until the child is one year old, and then the child's skills may regress (Mash & Wolfe, 2016). Research also reports that between 25-50% of children diagnosed may not develop verbal communication (Patten et al., 2013). This results in the child primarily communicating through nonverbal means (Mash & Wolfe, 2016). If so, the child could benefit from additional mechanisms in order for them to communicate with others (American Speech-Language-Hearing Association [ASHA], 2021) .

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One modality of communication that nonverbal individuals can utilize is Augmentative and Alternative Communication (AAC) (ASHA, 2021). AAC takes many forms, such as American Sign Language, Picture Exchange Communication, and speech-programs on an iPad. These systems assist their users in finding ways to verbally communicate with others. In order to assist nonverbal individuals learning AAC or to assist individuals in improving their communication skills, various types of therapy may be indicated.

Music therapy has been shown to be effective in addressing communication goals, both verbal and nonverbal (Carpente, 2011; Crowe, 2011; Delvin & Meadows, 2020; Edgerton, 1994; Fischer, 2012; Gadberry, 2012; Gattino et al., 2011; Lim & Draper, 2011; Kim et al., 2009; Markworth, 2014; Porter et al., 2017; Salomon-Gammon & Efelant, 2019). Research has shown that client's frequency, quality, and quantity of verbal communication has increased over the course of music therapy treatment (Crowe, 2011; Edgerton, 1994; Fischer, 2012; Gadberry, 2012; Lim & Draper, 2011; Porter et al., 2017; Salomon-Gimmon & Elefant, 2019). Similarly, client's nonverbal communication skills, such as body language, gestures, and musical conversation skills, have also improved due to music therapy treatment (Carpente, 2012; Crowe, 2011; Edgerton, 1994; Gattino et al., 2011; Kim et al., 2009; Markworth, 2014).

Many studies examining music therapy's effect on the communication skills of children with autism often examine either nonverbal or verbal communication skills. Contemporary research outside of music therapy suggests that both nonverbal and verbal communication should be examined together as both of these aspects are integral to understanding someone's communication (Jones & Lebaron, 2002). Only a few music therapy studies have examined the effects of music therapy on both clients with autism's nonverbal and verbal communication skills (Crowe, 2011; Edgerton, 1994). Beside, music therapy literature does not often include

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information discussing the use of AAC systems in sessions with individuals with autism (Delvin & Meadows, 2020; Gadberry 2012). Addressing these gaps in the literature, the current study will describe the process and outcome of the humanistic clinical work with a 13-year old male with autism who is nonverbal and uses an aided AAC device, his vocalizations, and gestures to communicate.

The described case study took place during the current researcher's internship, from June-December 2020. Prior to the internship, the researcher had a deep interest in researching music therapy with children/adolescents with autism due to their previous non-clinical work with the clientele. Additionally, a majority of the research the author reviewed during their graduate program focused on this topic. To come full circle within their graduate program, the author set out to investigate the effects of music therapy on a client with autism during their internship. The client was selected due to the quick establishment of therapeutic rapport, and the client's flexibility when integrating new therapeutic techniques into sessions. The client also utilized an AAC device; however, he had never or very seldomly used it within music therapy sessions prior to the work with the current researcher. Due to these factors and the lack of research investigating the effects of music therapy on verbal and nonverbal communication with an adolescent with autism, the researcher decided to delve into this topic.

Chapter 2

Literature Review

Definition and Etiology of ASD

Autism Spectrum Disorder (ASD) or autism (used interchangeably hereafter) is a neurodevelopmental disorder that affects the social skills (i.e. communication and interaction), and behavioral regulation of individuals diagnosed. Deficits in social communication and interaction can look like individuals having difficulty maintaining eye contact, initiating social interactions, issues with understanding social cues, and difficulty engaging in typical toy play. (American Psychiatric Association [APA], 2013). Deficits in behavioral regulation can be experienced when the people with autism try new things or foods, meet new people, visit new places out of their typical routines, or categorize toys by color (Mash & Wolfe, 2016).

Among several factors that impact the etiology of autism, the heritability and genetic components of the disorder seem to be dominant causes. The frequency of a child inheriting autism from their family ranges from 37%-90%, and the likelihood of a child being diagnosed with ASD increases alongside the number of siblings that have been diagnosed as well (APA, 2013; Weyandt, 2019). Genetically, there have been many studies examining multiple genes and their mutations with autism. Over 1,000 genes are found to be linked to ASD, some of which are associated with autism's core deficits (Weyandt, 2019). For example, the OXTR gene, an oxytocin receptor, is associated with social relatedness skills (Weyandt, 2019). Other genes such as the GABR3 gene, which impacts neuronal inhibition, and RELN gene, which is related to neuroplasticity in the brain, have also been connected to ASD (Persico & Napolioni, 2013).

Individuals diagnosed with autism also have different brain structures and volumes as compared to neurotypical individuals. Weyandt (2019) explains,

enlargement of the caudate nucleus, [this brain structure is part of the basal ganglia, which is critical for movement], has [also] been reported in ASD, and the degree of enlargement has been found to correlate with the severity of symptoms as well as restricted and repetitive behaviors (p. 289).

Depending on the brain location examined, smaller and larger brain location volumes were identified, such as parts of the frontal lobe and amygdala (Weyandt, 2019).

Both neural underconnectivity and neural overconnectivity issues are also reported for individuals with ASD (Maximo et al., 2014; Weyandt, 2019). Neural underconnectivity means that there is not enough neural communication and activity between different parts of the brain in order for messages to be properly communicated (Maximo et al., 2014). On the other hand, neural overconnectivity in the brain refers to the neural communication within different parts of the brain being too chaotic or over-stimulated for the communication to be delivered effectively. These findings explain the individuals' difficulties with social and communication skills as well as restrictive and repetitive behaviors (Maximo et al., 2014). Lastly, circumstances surrounding an individual's birth may increase their chances of being diagnosed. These circumstances can include: "...advanced parental age, low birth weight..." (APA, 2013, para. 24), prenatal exposure to toxins, or failure to thrive after birth (Mash & Wolfe, 2016).

Assessment and Diagnostic Criteria of ASD

The CDC (2020b) reports that ASD may be diagnosed around 18 months, but typically children are assessed and reliably diagnosed around two-three years old (Mash & Wolfe, 2016).

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Prior to receiving a formal assessment, a child may display certain behaviors or lack of behaviors indicative of autism. These indicators may include a lack of babbling by 12 months, limited facial expressions, loss of previously acquired skills, or difficulty with imaginative play (National Institute of Neurological Disorders and Stroke [NINDS], 2020). Children also receive developmental screening provided by their pediatricians at designated appointments. Screening includes brief tests and/or questionnaires (CDC, 2020c). If a child displays certain behaviors or their developmental screening indicates something out of the norm, the child may be referred for a formal assessment. These assessments are conducted by trained professionals, such as a “...psychologist, developmental-behavioral pediatrician, [or] child psychiatrist...”, and traditionally include an interdisciplinary team (American Psychiatric Association, 2018, para 11). The child would be assessed based on the diagnostic criteria for autism spectrum disorder as described in the DSM-5 (NINDS, 2020).

ASD has two primary diagnostic criteria: deficits in social skills and the presence of repetitive and restrictive behaviors (APA, 2013). According to the DSM-5 (2013), for an individual to be diagnosed with autism their social skill deficit must be:

persistent deficits in social communication and social interaction across multiple contexts, as manifested by all of the following, currently or by history:

1. Deficits in social-emotional reciprocity...
2. Deficits in nonverbal communication behaviors used from social interaction...
3. Deficits in developing, maintaining, and understanding relationships...(para. 1).

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Most children with autism display typical social development until around 6-12 months; however, either during or after this time period, many children's social skill development tends to stop or regress. Deficits in social interaction and communication may manifest as lack of eye contact, limited interest in typical objects, difficulty with joint attention, atypical facial expressions, difficulty understanding social situations, and stunted language development (CDC, 2020b; Mash & Wolfe, 2016). When examining a child's communication development, there may be portions of it that do not develop traditionally, not their ability to communicate as a whole. For example, a child's receptive communication skills may develop typically; however, the child's expressive communication may be an area in which the child needs additional assistance (APA, 2013).

The other domain of interest when examining diagnostic criteria for autism is restrictive and repetitive behaviors (APA, 2013). According to the DSM-5 (2013), individuals must fit these criteria of restrictive and repetitive behaviors in addition to the social skill deficits discussed above to be diagnosed with ASD:

Restricted, repetitive patterns of behavior, interests or activities, as manifested by at least two of the following, currently or by history:

1. Stereotyped or repetitive motor movements, use of objects, or speech...
2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior...
3. Highly restricted, fixated interests that are abnormal in intensity or focus...

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4. Hyper- or hypoactivity to sensory input or unusual interest in sensory aspects of the environment... (para. 2)

Restrictive behaviors may manifest as a child exhibiting rigidity when trying to deviate from a set schedule or lining up books instead of looking at each one of them (Mash & Wolfe, 2016). Repetitive behaviors may manifest as a child engaging in self-stimulating behavior. Stimming, or self-stimulatory behavior, can be defined as a child engaging in repetitive movements in order to internally stimulate their senses (Mash & Wolfe, 2016). Stimming can look like a child flapping their hands, rocking back and forth, or eye edging, which can be defined as a child tracing an object with their eye gaze (Richman, 2006).

While difficulties with social skills and restrictive and repetitive behaviors are the core diagnostic criteria for a diagnosis of autism, the DSM-5 also identifies other factors to examine when assessing children or individuals for autism (APA, 2013). These include definitive presentation of symptoms during a child's early life, the severity of symptoms causing significant impairment/disruption of daily life, and symptoms that are not better explained by another diagnosis. Furthermore, additional specifiers such as intellectual impairment, language impairment, additional medical/genetic condition, or another mental health disorder should be considered when diagnosing a child with autism. Finally, there are three levels of severity pertaining to ASD. These range from level 1, needing the least amount of support, to level 3, needing the most support (APA, 2013).

It is important to note that the diagnostic criteria for autism are wide-set (APA, 2013). Meaning that autism is considered a spectrum disorder, and that this can result in a number of different presentations of the disorder in each individual. For instance, the CDC (2020b) provides a short snapshot into how different manifestations of ASD may present. On their website, they

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include a photo with six different spectrums with dials placed on them, each spectrum representing different characteristics of ASD. The dials can be moved along the characteristic's spectrum. For example, communication, the dial can slide along the spectrum, moving from nonverbal to verbal (CDC, 2020b). So, each individual's placement along this spectrum is going to be different; as well as, their symptomology, the level, and severity of their diagnosis.

It is estimated that autism affects about 1 in 54 children in the United States (CDC, 2020c). Data also suggests that males are more likely to be diagnosed with autism rather than females (CDC, 2020c). Since there are a growing number of children diagnosed with autism it is suggested that children diagnosed receive early intervention treatment. By engaging in early intervention treatment, the child can develop as quickly and naturally as possible (Mash & Wolfe, 2016). There are a variety of interventions recommended for children diagnosed with autism. The CDC (2021) recommends seven types of early intervention treatments. They are as follows: Applied Behavior Analysis, Occupational Therapy, Treatment and Education of Autistic and related Communication-handicapped Children, Sensory Integration Therapy, Communication Interventions, Social Skills Groups, and DIRFloortime. Music therapy may provide children with autism a therapeutic avenue to address a wide range of individualized goals (Accordino et al., 2007; Kern et al., 2013; Reschke-Hernandez, 2011; Simpson & Keen, 2011).

Current Practices of Music Therapy with People with ASD

In the last 14 years, three literature reviews (Accordino et al., 2007; Reschke-Hernandez, 2011; Simpson & Keen, 2011) and one survey study (Kern et al., 2013) were conducted on the music therapy practice with people with ASD, and these studies provide useful information and knowledge about the current music therapy practice of the time. The most recent systematic

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review was conducted by Reschke-Hernandez (2011), exploring literature from the past 60 years (1950-2010). After analyzing 60 peer-reviewed journals and books, a narrative description of the music therapy history with children with autism was developed in two large chronological categories, 1950-1989 and 1990-2009. Most research in these two time periods investigated the effect of music therapy on communication, social, or emotional skills while utilizing recreative and improvisational methods. A difference between the research published from 1950-1989 and 1990-2009 was the study designs that contemporary research between 1999 and 2009 focused more on quantitative research, which was to provide measurable evidence of the effects of music therapy (Reschke-Hernandez, 2011).

Based on the results of their review, the researcher suggests that the literature lacks comparative studies that have adequate sample sizes and that it may not accurately reflect current clinical practice. The author also posits that in order for our field to advance, clinicians must start taking steps to more accurately describe the current practices in the field, expand upon technique knowledge, increase participant numbers, and increase comparative studies (Reschke-Hernandez, 2011).

Accordino et al. (2007) conducted a review of 20 research and case studies published between 1973 and 2000. 14 of the 20 studies only examined participants under the age of 18 and the remaining six studies included participants with ages ranging from 4-41. The majority of the literature examined music therapy's effectiveness in improving communication, social, and emotional goals while using recreative, improvisation, and receptive methods (Accordino et al., 2007).

Simpson and Keen (2011) reported similar findings to the two previous reviews. They analyzed 20 research studies and case studies published from 1990-2010 that focused on clients

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with autism age 0-18. Often, the researcher utilized various experimental designs to investigate music therapy with individuals between the ages of 3-11, and focused on the client's social, behavioral, and communication skills. (Simpson & Keen, 2011). Table 1 presents the summary of the three literature reviews discussed so far:

Table 1

Review of Music Therapy Literature

Author	Type of Review	No./Type of publications included	Methods	Results	Recommendations
Accordino et al., 2007	Narrative Literature Review	20 research and case studies between 1973 and 2000	Searched databases, PsychInfo, Medline, and reference lists	<u>Goals:</u> social, communication, and emotional <u>Methods:</u> receptive, recreative, and improvisational	Increase number of RCT's, blinded assessors, and research that answers more 'what' questions
Simpson & Keen, 2011	Narrative Literature Review	20 journal articles between 1990-2010	Searched databases using tailored search terms	<u>Goals:</u> social, behavioral, and communication <u>Methods:</u> receptive, recreative, and improvisational	Increase research's use of solely music therapy based interventions with large sample size
Reschke-Hernandez, 2011	Systematic review	60 sources published between 1950 and 2010	Searched various databases and music therapy journals with tailored search terms	<u>Goals:</u> communication and social goals <u>Methods:</u> recreative and improvisational	Conduct comparative, generalizable studies with larger sample sizes and explore the current unknowns within music therapy

These reviews are similar in a few ways. All three reviews noted that a majority of music therapy literature addresses therapeutic goals related to social, emotional, or communication skills (Accordino et al., 2007; Reschke-Hernandez, 2011; Simpson & Keen, 2011). Accordino et al (2007) and Reschke-Hernandez (2011) revealed that a majority of studies utilized recreative or

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improvisation methods when working with children with ASD. Reschke-Hernandez (2011) hypothesizes that the repetitive nature of the methods used may be due to a “...lack of detail in intervention reporting” (p. 200). As a result, clinicians cannot make accurate conclusions from the evidence as it relates to the effectiveness or efficaciousness of the method since there is not enough detail about the intervention to replicate it (Reschke-Hernandez, 2011). To address this concern within music therapy literature, researchers need to begin to explore different research designs that accommodate investigating different music therapy methods and practices, and provide more detailed intervention and observation reporting. This notion is further supported by other music therapy researchers (Robb et al., 2010; Robb et al., 2018).

Single case study designs allow researchers the opportunity to provide readers and other researchers with a unique insight into music therapy practices (Bruscia, 2012). This type of research design may be an effective avenue to address the concerns described by Reschke-Hernandez (2011). Some researchers argue that conducting case studies is integral to the development of music therapy (Giest & Hitchcock, 2014). While quantitative research is still important, case studies provide researchers with real-life clinical knowledge that may be directly applied to active research projects or building the body of literature to support the use of music therapy with a specific clientele (Giest & Hitchcock, 2014). Music therapists also work with diverse clientele; thus, case studies provide clinicians with a wide range of material to consult when working with varying clientele (Bruscia, 2012). Since case studies examine one client or group of clients, detailed reporting of client descriptions, assessment, treatment, observations, and interventions may occur more readily than randomized controlled trials (RCT), which in turn could make the case studies more replicable (Bruscia, 2012; Giest & Hitchcock, 2014).

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A recent online survey study conducted by Kern et al. (2013) also provides a glimpse into current music therapy clinical practice with clients diagnosed with autism. A 45-item questionnaire was emailed to 507 members of the American Music Therapy Association and shared via an online social media group. Music therapists were asked about their demographics and professional practice, such as the frequency of working with ASD, client age range, and music therapy methods or models utilized. The survey also contained items discussing music therapy assessments, documentation, treatment plans, and goal domains addressed during treatment. Participants' knowledge of ASD and understanding of current evidence-based practices were questioned as well (Kern et al., 2013).

A total of 328 music therapists completed the survey. The results indicate that a majority of the respondents reported primarily working with either children (77.2%) or teens (73.5%) with autism. In regards to goal domains, 97.9% of respondents described working on communication goals, 90.6% reported working on social goals, and 43.1% indicated working on emotional goals. With regard to methods used, a majority of music therapists utilize recreative (98.6%), receptive (84%), and improvisation (75.3%) methods in order to address client's goals with compositional methods being utilized by 55.7% of those surveyed (Kern et al., 2013).

Results of the Kern's (2013) survey are consistent with the findings of the three previous reviews of literature (Accordino et al., 2007; Reschke-Hernandez, 2011; Simpson & Keen, 2011). While there is consistency in this body of literature, it is now necessary to delve deeper into specific music therapy methods and techniques being utilized in clinical practice to address social, emotional, and communication goals with children with autism.

Social and Emotional Goals addressed in Music Therapy

In examining music therapists' clinical practice related to addressing social skills with children with autism, therapists primarily work on client's eye contact, conversation skills, joint attention, and synchronicity (Kim et al., 2008; LaGasse, 2015; Pater et al., 2021; Yoo & Kim, 2018). A prime example is found in a quantitative study that examined the effect of music therapy on the social skills of a group of children with autism (LaGasse, 2015). Seventeen participants were randomly assigned to a music therapy or a social skills group. Each group met biweekly for one 50-minute session for five consecutive weeks. Participants' social skills were assessed through two questionnaires, completed by participant's parents throughout various time increments of the study. Video analyses were completed of the participants during the third and tenth session. Results of the study showed that music therapy significantly increased the frequency of client's eye contact and attention towards others in comparison to the social skills group (LaGasse, 2015).

A majority of the literature pertaining to social goals with children with ASD reveal similar findings to those of LaGasse (2015). Oftentimes, these studies utilized quantitative research designs and some compared the effects of music therapy on participants compared to a control condition. While other studies examined the impact of music therapy by examining various time increments throughout treatment. Recreative and improvisational methods were the most common methods examined (Kim et al., 2008; Pater et al., 2021; Thompson et al., 2013; Yoo & Kim, 2018). Case studies also detailed similar findings to quantitative research.

Bull (2008) describes a case study evaluating the effects of co-leading a music therapy group for young children with autism and their mothers on the children's social skills. The case

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study details the positive impact of giving the children and their mother a dual therapeutic space. During some of the music therapy sessions, the mothers were able to connect with their child through free improvisation. In other musical experiences, the music therapist would lead the children through an intervention while the other co-therapist would provide the mothers with a safe space to express their feelings. In turn, this dual experience allowed the mothers to prosper more, both musically and socially, with their children during their group time together (Bull, 2008).

The literature describing the effects of music therapy on the emotional skills of children with autism closely resembles the previous literature described. A majority of the studies examining this topic utilize quantitative research designs primarily comparing the effects of music therapy on participants' emotional skills throughout various time increments in treatment. Researchers utilized improvisation and recreative methods throughout their studies. The results of these studies indicated that music therapy significantly improved client's self-esteem, depressive moods, understanding of emotional states, and emotive playing (Katagiri 2009; Kim et al., 2009; Porter et al., 2017). This evidence suggests that music therapy has a positive and significant impact on the social and emotional skills of children with autism, which can make further impact on a child's communication skills.

Communication, Autism, and Music Therapy

As a human being, the ability to convey our wants and needs to other individuals is integral to our overall quality of life. In many cases, children with autism often miss neurotypical communication and speech developmental milestones (APA, 2013). Thus it becomes one of the

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most common addressed goals when working with clients with autism (Kern et al., 2013). As the current study examines whether individual music therapy improves a client's communication skills, this section will discuss what communication is and how nonverbal and verbal communication can be integral to understanding how and what others communicate.

Verbal and Nonverbal Communication

Bogdashina (2004) defines communication as "...the transmission and reception of information" (p. 21) between two or more individuals. The relationship that is developing between these individuals is considered important because the information is being processed and relayed simultaneously within the relationships and contexts between all parties involved (Bogdashina, 2004). The process of communication is complex and can be difficult for any individual; however, due to autism's core deficits, the communication process can cause even more challenges to many children and individuals with autism. While there are often multiple manifestations of communication deficits, typically autism impacts a child's ability to communicate verbally and nonverbally (Mash & Wolfe, 2016). It is important to acknowledge and comprehend the differences between verbal and nonverbal communication as it leads neurotypical individuals to have a better understanding of how to communicate with individuals with autism.

In order to understand what verbal communication is, one must first define it. According to the *Encyclopedia of Autism Spectrum Disorders*, "verbal communication refers to the production of spoken language to send an intentional message to a listener" (McDuffie, 2013, p. 3240). Bogdashina (2004) further expands the definition of verbal communication by stating that written and sign language should be included alongside spoken (verbal) language. The inclusion

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of written and sign language into the definition of ‘verbal communication’ is important as some children with autism may have a deficit in their verbal language development. For instance, a child with autism may typically develop their ability to understand verbal communication, but lack the skills to vocally produce verbal language (AHSA, 2021). In turn, the child may utilize sign language or an Augmentative and Alternative Communication (AAC) system to verbally communicate with others (ASHA, 2021).

AAC is defined as “incorporate[ing] the individual’s full communication abilities and may include any existing speech or vocalizations, gestures, manual signs, and aided communication” (ASHA, 2021, para.1). AAC provides individuals who have difficulties with vocal language different avenues to verbally communicate with others. One can conclude that although a child with autism may be considered ‘nonverbal,’ as they lack the necessary skills to produce vocal language, it does not eliminate the child’s potential to verbally communicate.

There are two categories of AAC systems: unaided and aided. Unaided AAC systems “...do not require an external tool” to communicate (ASHA, 2021, para. 11) and those can include American Sign Language or vocalizations (ASHA, 2021). Aided AAC systems “...require some form of external support--either electronic or nonelectronic” (ASHA, 2021, para. 12), which may look like a client using an iPad to select a picture symbol that correlates to what they would like to communicate and the iPad vocally generates that symbol (AHSA, 2021). Other clients may have a picture binder in which they select a picture and then give it to their communicative partner (Devlin & Meadows, 2020). Regardless of the verbal language an individual is using to communicate, they still communicate through other nonverbal ways that are integral to understand.

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Nonverbal communication is “the act of conveying information without the use of words” (APA, 2021, para. 1), which can include an individual’s “body language, facial expressions, or gestures...” (Bogdashina, 2004, p. 22). Children with autism who do not develop verbal language commonly communicate with others through gestures (Mash & Wolfe, 2016). These gestures can be exemplified by a child pointing to the glass of water they would like or handing a broken toy to their caregiver to fix.

Stone et al. (1997) studied nonverbal behaviors when children with autism were requesting, commenting, or communicating with an adult as compared to children with a developmental delay. Results indicated that children with autism typically communicated with simple gestures as compared to children with a developmental delay. The researchers also noted that children with ASD often engaged in communicative acts that were deemed as ‘requesting’ compared to ‘commenting’ with an adult (Stone et al., 1997). While understanding the differences between verbal and nonverbal communication are important, it is also important to consider why it is integral to examine them together under the umbrella of ‘communication’.

Integration of Verbal and Nonverbal Behavior

It can be argued that when talking with another individual oftentimes it is difficult not to read into the other’s body language or their facial expression. If one was to only listen to what an individual was saying to them, completely ignoring their nonverbal behaviors, one might miss key nonverbal cues. Additionally, if one were only to pay attention to the individual’s nonverbal communication, one would completely miss the content of the communication. This real-life example is meant to establish the notion that both verbal and non-verbal communication behaviors are both important when examining someone’s communication.

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The integration and examination of both types of communicative behaviors are even more essential to understanding a child with autism's communication skill set (Jones & Lebaron, 2002). For instance, when a music therapist is working with a nonverbal child with autism, it is important that the music therapist understands how their client communicates verbally and nonverbally. A therapist's ability to assess how the client communicates in both ways allows the music therapist to make better informed decisions about the client's goals, objectives, and treatment. This ability also allows the therapist to be consistent with meeting the client where they are at, both in terms of emotion and skill set.

Researchers in communication and business fields discuss the importance of investigating both verbal and nonverbal communication simultaneously, not separately, in research. Researchers argue that examining these behaviors separately is antiquated due to contemporary ideas that state that communication is how "...visible and audible [behaviors] function together..." (Jones & Lebaron, 2002, p. 499). By examining verbal and nonverbal behaviors separately, researchers are neglecting a key aspect to understanding the total picture of someone's communication style or skill set. Continuing, the authors provide readers with a narrative list of the current literature supporting the idea that verbal and nonverbal behavior should be researched together (Jones & Lebaron, 2002). While this article is outside of the music therapy literature, it is important for music therapists to examine in order to continue progressing the research standards of the field. There are studies within music therapy that examine its effect with children with ASD's skills in nonverbal communication, verbal communication, and all aspects of communication simultaneously.

Communication Goals in Music Therapy

In terms of nonverbal communication, music therapists typically address this goal by working on client's body language, gestures, or musical conversation skills (Carpente, 2012; Crowe, 2011; Edgerton, 1994; Gattino et al., 2011; Kim et al., 2009; Markworth, 2014). When addressing verbal communication, music therapists typically address a client's ability to independently vocalize, expand upon their current language, or increase their ability to communicate their wants and needs (Crowe, 2011; Edgerton, 1994; Fischer, 2012; Gadberry, 2012; Lim & Draper, 2011; Porter et al., 2017; Salomon-Gimmon & Elefant, 2019).

The research examining nonverbal communication skills with children with autism often utilize improvisation as the primary intervention in the experimental condition. For instance, Kim et al. (2009) investigated the impact of improvisational music therapy on children with autism's nonverbal communication skills as compared to a play-based intervention. Ten children were randomly assigned to receive either music therapy or the play-based therapy first. Once the first treatment condition was completed after 12 weeks, the participants received the other condition for the same amount of time. Each child participated in both treatment conditions once a week for 30 minutes. Researchers analyzed the frequency of the children's initiation of musical conversations/play and willingness to engage with the therapist during sessions 1, 4, 8, and 12 of each condition. The researchers found that music therapy was significantly more effective in increasing the participants' likelihood to initiate musical conversations as compared to the play-based therapy (Kim et al., 2009).

Markworth's (2014) qualitative study investigating the effects of improvisation-based music therapy on the nonverbal communication skills of children with autism yield similar findings to those of Kim et al. (2009). The researcher recruited three music therapists working

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with minimally verbal children with autism, who worked from a Nordoff-Robbins based practice. One video-taped session from each of the music therapists was obtained. Then, the video was analyzed, and open-ended questions were formulated in order to interview each therapist (Markworth, 2014). Upon reflection, Markworth (2014) notes that music therapy aided in increasing the client's nonverbal behaviors of initiating musical conversations, body language, and validation of the other's musical thoughts.

Case studies also provide similar support to the findings of the studies discussed above. One case study describes a music therapist's work utilizing Nordoff-Robbins Music Therapy with an 8 year-old child with autism. Throughout the case study, the author describes the client's systematic progress from initially having difficulties engaging in extended musical play to eventually initiating and communicating musically with the music therapist through improvisation (Carpente, 2012).

Improvisation is an extremely effective method in order to address children with autism's nonverbal communication skills. This method provides both the therapist and client with a different avenue of communication, music. Musical conversations are able to foster a positive relationship between the therapist and client in order to improve the client's body language and initiation/ continuation of conversations (Carpente, 2012; Kim et al., 2009; Markworth, 2014). Improvisation can also be effective in improving a client's verbal communication skills.

Salomon-Gimmon and Elefant (2019) examined the effects of improvisational music therapy (IMT) on the verbal communication skills of children with autism. Four participants, ages 4-5, were recruited for the study. Two participants received 30 minute music therapy sessions three times a week for five months, while the other two participants received 30 minute sessions once a week for five months. Researchers found that IMT was effective, yet not

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significant, in improving client's vocal communication. Specifically, the researchers noted that each client engaged in more frequent and deliberate verbal communication compared to the beginning of their music therapy treatment (Salomon-Gimmon & Elefant, 2019). Researchers also found similar and statistically significant results when utilizing IMT with older children and adolescents to improve their communication skills (Porter et al., 2017).

Kim et al., (2009), Markworth (2014), Salomon-Gimmon and Elefant (2019), and Porter et al. (2017) provide foundational evidence for the use of improvisational music therapy with children with autism in order to improve their nonverbal and verbal communication skills; however, the studies mentioned examine nonverbal and verbal behaviors separately, not simultaneously. The examination of both nonverbal and verbal communication in music therapy with children with autism is seldom, although there is limited research. A good example of this can be seen in an experimental study conducted by Edgerton (1994). In this study, the researcher recruited 11 children with autism. A reversal design was utilized to examine the effectiveness of improvisational music therapy. Within this design, the participants received five initial weeks of IMT, then one week of primarily recreative music therapy, and then were reintroduced to IMT for the final four weeks of the study. The sessions were video recorded and predetermined time intervals were coded with an assessment tool designed by the researcher. The assessment tool examined the client's nonverbal and verbal responses throughout the session. After independent assessors, two undergraduate music therapy students, assessed the data, the researcher found that IMT was statistically significant in improving the client's nonverbal and verbal communication behaviors. Additionally, the researcher noted that there was a significant relationship between increases in the client's musical verbal behaviors and increases in the client's nonmusical vocalizations throughout the session (Edgerton, 1994).

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The research discussed up to this point has investigated improvisation as the primary experimental condition. While this partially aligns with current clinical practice, as found in Kern et al.'s (2013) survey, it is also important for music therapy research to examine the other three methods. Kern et al.'s (2013) survey suggests that recreative and receptive methods are almost equally utilized by music therapists with their clients with autism as compared to improvisation; however, improvisation appears to be the most researched method. While improvisation may provide clients with a nonverbal means of communication, this method will not always be appropriate or therapeutically indicated for all clients. A client may not engage actively with instruments during sessions, making instrumental improvisation difficult. Conversely, clients may have motor functioning concerns that need to be addressed prior to improvisation. It is important to acknowledge the potential limitations of only studying improvisation with clients as the research may not be generalizable to all music therapists and their clients. Thus, additional research examining the other methods of music therapy with children with autism must be examined.

Recreative interventions appear to be the next most common method investigated with clients with autism. One study in particular examined the effects of music therapy and speech therapy on language acquisition of preschool-aged children with autism. The researchers selected 30 targeted words/phrases to teach throughout each experimental condition. 22 children were randomly assigned to receive either music therapy or speech therapy first, with the children receiving the other experimental condition after the first was completed. In the music therapy condition, recreative methods were primarily utilized to teach the targeted words/phrases. Researchers found that both music therapy and speech therapy were significant in increasing the

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children's language acquisition; however, there was no statistical difference between the two (Lim & Draper, 2011).

Additional research utilizing other methods of music therapy when addressing children with autism's communication skills reveal similar findings to that of Lim & Draper's (2011) study. Results of other research indicate that other music therapy methods improved client's nonverbal communication and the appropriateness and quality of a client's verbal communication (Crowe, 2011; Fischner, 2012; Gattino et al., 2011). Whether therapists are utilizing improvisation or any other method in music therapy, the literature supports the notion that music therapy is effective in improving a client with autism's nonverbal and verbal communication. While there is little research that examines the improvement of both communication behaviors simultaneously, there is an additional component of verbal communication to consider when working with children with autism.

Music Therapy and AAC literature

AAC systems in music therapy is not a common topic discussed in the literature, but it is still important to examine. McCarthy et al. (2008) surveyed music therapists on their opinions and experiences working with speech-language pathologists and AAC systems. 847 music therapists completed the survey. The data revealed that music therapists work with a variety of clientele, such as ASD, developmental delay, language/speech impairment, etc, who utilize AAC systems. The authors reported that about half of their surveyors have utilized AAC systems within sessions while addressing expressive and receptive communication goals, with 67% reporting using AAC devices with vocal output. Interestingly, the authors reported that on

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average, music therapists felt they possessed adequate knowledge on how to properly implement client's AAC systems within sessions (McCarthy et al., 2008).

Gadberry (2011) took McCarthy et al's (2008) research and modified the survey by specifically examining music therapists who work with clients with autism that utilize aided AAC systems. The researcher found that very few (14.6%) music therapists used all of their client's aided AAC systems within music therapy sessions. When aided AAC systems were utilized in sessions, therapists often addressed client's expressive communication, receptive communication, meaningful choices, and behavior management skills (Gadberry, 2011). Finally, it was noted that 60% of those who responded "...had not received additional training outside of their music therapy coursework in aided AAC" (Gadberry, 2011, p. 80).

Another researcher was influenced by Gadberry (2011) and McCarthy et al's (2008) surveys, and investigated a potential correlation between a music therapist's training and the therapist's use of AAC systems within sessions (Roberts, 2012). The survey consisted of 17 questions pertaining to music therapist' demographics, AAC experience, and education. Forty-two music therapists completed the survey. Results indicated that 14.3% of the music therapists who utilized AAC systems in sessions had not received any formal training on their client's AAC systems. Those who did receive some type of training commonly reported receiving an 'in-service' training or were trained by a speech pathologist. Results also indicated that 21.3% of the respondents who use their client's AAC systems in sessions used them throughout all sessions. These therapists also reported often incorporating client's AAC systems into sessions by working on communication, meaningful choice, and social goals (Roberts, 2012).

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These surveys provide evidence that music therapists are currently implementing client's AAC systems in clinical settings. Therapists are also using these devices to aid in the development of a client's receptive and expressive communication skills (Gadberry, 2011; McCarthy et al., 2008; Roberts, 2012). Yet, research examining music therapy and AAC systems is sparse, resulting in only two published articles.

Expanding on their previous research, Gadberry (2012) examined the effects of music therapy on participant's communicative acts with and without their aided AAC systems present. The researcher recruited six music therapists working with individuals who utilized aided AAC systems. From the six music therapists, nine clients were recruited for the study, with seven clients being diagnosed with autism. Two sessions were video recorded with each client, one with their aided AAC system present, and one without. Interventions were the same throughout each condition. Videos were analyzed by the researcher and one trained rater. The researcher found that participants engaged in significantly higher rates of communicative acts with their aided AAC systems present compared to when they were not, with the most common communicative act being 'answers' (Gadberry, 2012).

To provide clinicians with examples of how to effectively integrate client's AAC systems into sessions, Delvin and Meadows (2020) published an article detailing the use of AAC systems in four case vignettes. Two vignettes described the use of AAC systems with children with autism. The first vignette describes a music therapist's work with a child utilizing sign language. To increase the client's communication, the music therapist targeted client-specific ASL words during the session while also integrating these signs into various music experiences. The second vignette describes the work with a 10 year old male with autism using an aided AAC system. Based on the discussions, the authors concluded that the music therapist was able to naturally

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integrate the aided AAC system into the client's session while also naturally modeling expressive language for the client on his AAC system (Delvin & Meadows, 2020).

Gadberry (2012) and Devlin and Meadows (2020) provide preliminary evidence for music therapy's use with children with autism who utilize AAC systems in order to increase their communication. While Gadberry (2012) and Devlin and Meadows (2020) studies examine verbal communication from the lens of client's using an AAC system, in general the researchers were still examining music therapy's effect on the client's verbal communication. As argued previously verbal communication can include spoken (verbal), written, and sign language as different verbal avenues of communication, including various AAC systems (Bogdashina, 2004). Thus while Gadberry (2012) and Devlin and Meadows (2020) examined a different avenue of verbal communication, their results that music therapy can increase a client's verbal communication behaviors still reinforce previous literature discussed on the same topic (Crowe, 2011; Edgerton, 1994; Fischer, 2012; Lim & Draper, 2011; Salomon-Gimmon & Elefant, 2019).

Case Study Proposal

Based on the review of the literature, it was evident that music therapy can be effective in increasing the communication skills of individuals with autism (Crowe, 2011; Edgerton, 1994; Fischer, 2012; Gadberry, 2012; Lim & Draper, 2011; Markworth, 2014; Salomon-Gimmon & Elefant, 2019). However, there is little research on examining both a client's verbal and nonverbal communication behavior. Additionally, no study was found to investigate the improvement of communication skills while consistently utilizing an AAC system in music therapy. Thus, the current study aims to examine the effects of music therapy on a 13-year old

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male's nonverbal and verbal communication skills while using the client's AAC device to promote verbal communication. The research question is how does music therapy impact a 13 year old with autism's verbal communication, through his AAC device and vocalizations, and nonverbal communication, through his gestures, over the course of at least 6 months of treatment?

Chapter 3

Method

Study Design

Murphy (2016) defines case studies as “an in-depth empirical inquiry of a bounded system within a real-life setting” (p. 570). The bounded system could be multiple individual cases with the researcher drawing conclusions based on the information presented or a phenomenon with a singular client (Leary, 2012; Murphy, 2016). The latter was the focus of the current study.

In terms of types of case studies, this research design can be researched from two different perspectives: objectivist or interpretivist. According to Ridder and Fachner (2016), both perspectives have five characteristics in common:

1. involving an empirical investigation of a particular contemporary phenomenon;
2. exploring complexity through the use of multiple data sources;
3. being situated in the real-world setting;
4. being suited to music therapy research where phenomena are complex and based in reality;
5. (and) enabling others to make judgements about the relevance of findings to their own situation because it is contextual, with thick description... (p. 291)

There are two key criteria that separate objectivist case studies compared to interpretive (Ridder & Fachner, 2016). Objectivist case studies utilize objective and standardized data collection measures. These measures allow researchers to account for test-retest reliability and for the data to be analyzed by blinded assessors. In other situations, standardized data collection measures may allow the researcher to compare their data to systematized norm reference data. The other criteria objectivist case study must meet is that the study should be replicable. Studies

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should contain clear and concise study procedures, data analysis, and detailed participant selection criteria in order to be considered replicable (Ridder & Fachner, 2016). Due to the circumstances within an objectivist case study, the author's current case study was considered interpretivist.

One of the primary distinctions that set interpretivist case studies apart from objectivist case studies is the notion that researchers are interested in "insight and discovery as opposed to testing a hypothesis" (Murphy, 2016, p. 570). Within the current author's case study, the author was interested in a 'how' question inside of the client's therapeutic phenomena. The author was also interested in allowing the nature of treatment with the selected client to ebb and flow over time, not sticking to a strict protocol. This type of research is naturalistic, real-world research.

Interpretivist case studies can be descriptive, exploratory, or explanatory. Descriptive case studies tend to simply describe and "answer [the] 'what' questions" when examining an experience or event (Murphy, 2016, p. 571). Exploratory case studies gather more information about an experience or event so that future studies may evolve. Explanatory case studies assist researchers in formulating themes about the observed experiences or events (Murphy, 2016). The current case study used an explanatory interpretivist case study design in order to answer 'how' questions and to develop themes between the client's development of their communication and the therapist's perspective.

Clinical Setting and Recruitment

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The case study was conducted at a university-affiliated internship, a small private practice in the Western portion of the United States. The private practice employed one music therapist, and the author of the current study was a music therapy intern student. Clients with a wide age range participated in the program, and the primary diagnosis of most clients fell under developmental disabilities. The selection criteria for this case study were fairly broad. The researcher was interested in examining the effects of music therapy with an individual with ASD. Due to the researcher's internship caseload, there was a small pool of potential clients with the diagnosis.

After two months of working with clients, the researcher determined that the client was a good fit based on the researcher's rapport with the client and their family and the client's skill set. The researcher and her supervisor approached the client's family and described the researcher's case study. The family was assured that the client's identity would not be disclosed, and the family would have full transparency with the researcher and her supervisor throughout the research period. Finally, the family was also informed that they would be able to receive a copy of the final case study once the researcher had completed their thesis defense. After clarifying questions were answered, the family consented to the client being a part of the case study. Clinical case study research is exempt from Institution Review Board review and was therefore reviewed with graduate academic advisor and internship supervisor.

Participant: Music Therapy History and Assessment

The client selected for this case study is BC, a 13-year-old male diagnosed with Autism Spectrum Disorder, Phelan-McDermid Syndrome (PMS), and Pediatric Acute-one Neuropsychiatric Syndrome (PANs). Phelan-McDermid Syndrome is a genetic condition that

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impacts an individual's development. Individuals with this syndrome often display developmental delays and exhibit issues with language, sleeping, and behavior regulation. This syndrome is also heavily associated with autism, with 75% of individuals diagnosed with PMS having a comorbid diagnosis of autism (Phelan-McDermid Syndrome Foundation, 2021). PANs defined by a "sudden onset of obsessive-compulsive symptoms and/or severe eating restrictions, along with at least two other cognitive, behavioral, or neurological symptoms" (Genetic and Rare Disease Information Center [GARD], 2021, para. 1). PANs is also characterized by having 'episodes' of symptomatology, with symptoms coming and going over time (GARD, 2021).

The client is primarily nonverbal, exhibiting limited verbals and communicating with others through gestures or his AAC device. The client enjoys physical activity, engaging in repetitive play, and listening to music. BC's parents also report that he has difficulty with generalizing communication outside of immediate family members, motor imitation, and executive functioning.

Per the parental report, BC was originally referred to music therapy services due to his enjoyment of music and regression in his social and communication skills at the age of six. BC has been receiving music therapy for seven years, with the researcher and her supervisor being the client's second pair of music therapists. The client has been a part of the researcher and her supervisor's caseload since December 2019, with the researcher beginning work with the client in June 2020. The researcher's supervisor formally assessed the client from December 2019-February 2020. From the assessment data, the client exhibited upper and lower extremity muscle weakness, atypical gait, and difficulties imitating motor movement, which was also confirmed by the client's mother. With regard to the cognitive skills, the client understood basic academic concepts such as identifying colors, letters, and body parts. BC also displayed fair

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social skills, but had difficulty maintaining communication with his AAC device. In turn, he primarily communicated through gestures.

Almost immediately after the researcher's supervisor had completed their formal assessment, COVID-19 impacted the supervisor's practice. The supervisor's state went into a "Stay At Home" order, which required BC's sessions to be switched to telehealth. Per the supervisor's report, therapeutic rapport and progress were slow over the following few months due to the transition. In-person sessions for BC began back up in June 2020, which is when the current researcher began working with him. The researcher formally assessed the client throughout four sessions in June 2020, which resulted in similar findings to that of the supervisor. The formal assessment tool utilized by the researcher and her supervisor was a self-designed assessment tool as designed by the researcher's supervisor. This assessment tool was based on the supervisor's clinical experience, information from previous music therapy assessment tools, and interdisciplinary treatment collaboration.

The four assessment sessions were extremely fluid in nature, with the researcher and her supervisor following the lead of the client. The researcher and her supervisor would lay out a variety of instruments for the client to explore and appropriately respond if the client displayed interest. Interventions in the moment were also selected based on the client's preferences in order to potentially elicit a variety of response, such as selecting a recreative intervention with the client's preferred songs.

The researcher noted that the client was fairly vocal throughout each session; however, the client would not fill in musical gaps left by the researcher or their supervisor. BC also displayed a limited interest in engaging with any type of traditional musical instrument such as picking up small bells and smelling them rather than playing them along with the researcher.

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However, the client did enjoy and benefit from sensory interventions, such as cabasa massages and feeling the vibrations from a large drum, conducted throughout the assessment. Based on the researcher and their supervisor's assessment, goals pertaining to the client's communication/speech, motor coordination, and self-expression were formulated as follow:

Goal 1) To increase BC's bilateral coordination

Goal 1 Objective 1: By December 2020, when using one hand, BC will independently engage in at least five consecutive drum strokes throughout a two minute recreative intervention.

Goal 2) To improve BC's functional communication

Goal 2 Objective 1: By December 2020, BC will verbally approximate at least three sounds when imitating the therapist's vocal output.

Goal 2 Objective 2: By December 2020, BC will readily communicate with his AAC device, when appropriate, throughout at least 35% of the session.

Goal 3) To provide BC with opportunities to engage in self-expression

Goal 3 Objective 1: By December 2020, BC, with at least two point prompts, will be able to tell someone at least three facts about himself utilizing his AAC device.

Case Study Procedure

Once informed consent had been received from the client's parents for the client to participate in the therapist's thesis research, BC's sessions occurred once a week for 45 minutes from June to December, 2020. The researcher wrote detailed session notes throughout the whole research period. Video-recordings of three sessions were collected in the last two months.

Music Therapy Sessions

Typically, the researcher entered each session with a hello song, which was accompanied by guitar. The client engaged in some type of greeting towards the researcher or told them how they were feeling that day on their AAC device. After the hello song, the pair engaged in some type of recreative interventions such as the ones described in the Table 2 to further bring the client into the therapeutic space. Afterwards, BC tended to choose a preferred activity, which was almost always reading or singing a book. The latter half of the session was more fluid in nature. Typically, the pair engaged in either a recreative or compositional intervention. On a handful of occasions, the pair engaged in an unconventional improvisation where the therapist would bring out a large drum or ocean drum, and the group would throw little beads onto the drum to a beat, with the client imitating the researcher or her supervisor. Prior to the goodbye song, the pair typically had a cool down to help the client continue to regulate. Cool downs would include a cabasa massage, singing a song while blowing bubbles, or a receptive intervention focused on breath work. Once a cool down was completed, the session would end with a goodbye song, accompanied by a guitar. A more detailed list of interventions is presented in Table 2.

Table 2

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Music Therapy Intervention List

Music Therapy Interventions Case Study: BC	
Method	Intervention and Description
Receptive	<ul style="list-style-type: none"> • Cabasa massage <ul style="list-style-type: none"> ◦ BC gestures or uses his AAC device to communicate if he wants more or where he would like the massage • Parachute to slow, preferred music • Short relaxations focused on taking deep breaths • Sensory integration <ul style="list-style-type: none"> ◦ Therapuddy, threading beads • Reading books • Singing along to books • Action listening • For example, BC imitating the therapist's motor movements in <i>Ants Go Marching</i>
Recreative	<ul style="list-style-type: none"> • Singing client preferred songs <ul style="list-style-type: none"> ◦ Allowing space for BC to engage with vocalizations or his AAC device • Playing instruments non-traditionally to client preferred songs <ul style="list-style-type: none"> ◦ For example, throwing beads onto an ocean drum with BC or rolling a ball to the beat • Playing instrument to a beat
Improvisational	<ul style="list-style-type: none"> • Instrumental nonreferential <ul style="list-style-type: none"> ◦ BC would engage in nontraditional instrument play while improvising • Throwing beads onto a ocean drum
Creative:	<ul style="list-style-type: none"> • Structure songwriting <ul style="list-style-type: none"> ◦ <i>Never One Thing</i> by May Erlewine ◦ <i>Help</i> by the Beatles • <i>Ants Go Marching</i> Children's Tune

Data Collection

Data collection took place throughout the six months of the researcher's internship. The video data was collected from October - December 2020. The nature of the researcher's case study evolved over the course of treatment with BC, and the case study procedure was not

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finalized until after treatment with BC had begun. The researcher also wanted to investigate the impact of music therapy with BC once a solid therapeutic rapport had been built with BC, and the researcher did not take over as the primary therapist with BC until late August 2020. For these reasons, the researcher and her supervisor decided to begin video-recording sessions towards the end of the researcher's internship. Text data was collected from June - December 2020. The text collected was a requirement of the researcher's internship and was later deemed to be important to the researcher's case study.

Video Data

Data collection took place during the researcher's designated session 1, session 4, and session 8 throughout October - December 2020 in order to give the client, the researcher, and her supervisor adequate time to make therapeutic progress prior to video recording. Sessions were recorded by the researcher on a designated phone positioned on a short shelf within BC's living room. Within each video, the researcher and the client were constantly displayed. From time to time, the researcher's supervisor or the client's mother were also present. The video-recorded sessions lasted between 30-45 minutes, depending on the flow of each session and the duration of a parental-therapist discussion of the client's week prior to the sessions beginning. Each video was securely stored in a HIPPA compliant electronic folder.

Text Data

After each session, the researcher took brief notes on what time the researcher and her supervisor arrived at the session, the date, goals of the session, how the client progressed towards their goals, short therapist reflections, and any other relevant information deemed necessary by the researcher. The notes were kept in a HIPPA compliant electronic folder with all other

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necessary client information. The notes were often referred to throughout the researcher's internship in order to best design session plans and protocols for BC.

Data Analysis

Video Analysis

In order to examine the client's nonverbal and verbal communication progress, the researcher developed an analysis sheet (see Appendix I), enabling the researcher to record the following data:

- 1) frequency of independent communicative responses by the client (nonverbal and verbal),
- 2) frequency of prompted communicative responses (nonverbal and verbal),
- 3) type of prompts provided by the therapist in order to assist the client's communicative response (point, verbal, gestural, or physical prompts).

Once the videos were analyzed, the researcher placed the data in a spreadsheet to average the researcher's and the secondary coder's data. Then, the average data collected from the client's session videos were plotted onto a graph. This type of analysis was appropriate for this research design due to not having a control group and other participants (Leary, 2012). Verbal and nonverbal behaviors were separated into their respective categories and organized by session within each graph. Types of prompts and their quantities were placed into an additional graph. Finally, the client's progress was examined as change over time (i.e. session 1 compared to session 4 and session 8). This examination was indicated as the client was consistently involved in treatment, and there was no 'baseline' conducted.

Session Notes Analysis

Qualitative text analysis within interpretivist case study designs can take many forms such as: first-person or grounded theory, thematic analysis, or phenomenological inquiry (Murphy, 2016). The researcher conducted a narrative inquiry for text analysis. This type of analysis is defined as “the study of human lived experience portrayed through engaging, meaningful, and personal stories” (Hadley & Edwards, 2016, p. 527). The case study client, BC, is primarily nonverbal. While the client does communicate through an AAC device, limited verbals, and gestures, the client’s communication is still developing. Thus, it was the goal of the researcher to provide themselves and others insight into how this client’s communication developed in music therapy through the researcher’s own eyes.

In order to draw conclusions from the researcher’s narratives, the researcher drew upon analytical ideas from Tuastad and Stige (2015) as well as DiMaio (2019). Tuastad and Stige (2015) discuss their process of narrative inquiry emphasizing the importance of generating individualized themes found within their narrative groupings. DiMaio (2019) suggests the concept of grouping of certain “...units of meaning...” (p.9), and then interpreting these units. Accordingly, the researcher took three steps in analyzing the text data. First, the researcher took their text data and grouped them into three different treatment narrative sections. Each section contained the text that applied to the overarching theme found within. Second, the researcher concluded additional identifying themes throughout the three narrative sections pertaining to the researcher’s understanding and perspective of the client’s communication progress throughout the designated time. Finally, the researcher paid special attention to the narrative sections in which the client’s video recorded sessions were taken, and further themes were drawn.

The Credibility of Data Analyses

Video Analysis

Three video recordings were coded by the researcher and a secondary coder. The second coder or observer was necessary in order to establish reliability (Leary, 2012). This specific type of reliability is referred to as interrater reliability, which “involves the consistency among two or more researchers who observe and record participant’s behavior” (Leary, 2012, p.60). By having an additional coder, the researcher may attempt to negate observer bias, which innate within this research design (Leary, 2012). The secondary coder within this case study was the researcher’s internship supervisor. The supervisor was selected due to therapist availability and connection to the researcher. The researcher’s supervisor also had previous experience working with clients who are nonverbal and use an AAC system to verbally communicate. In order to calculate the inter-rater reliability, the agreement-disagreement formula (Gadberry, 2012) was utilized, which has also been used by other researchers in the field.

Text Analysis

Reflexivity is an integral part of interpretivist research (Wheeler, 2016). This principle is based on the notion “...that the experiences being investigated are seen through the researcher’s eyes and heard through the researcher’s ears, and thus are shared in the researcher’s voice” (Wheeler, 2016, p. 140). It is important to acknowledge the researcher’s personal biases and theoretical orientation as it deeply impacts the clinical work with BC that will be analyzed within the text data.

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The researcher has worked with children with autism for at least three years. This has deeply impacted her viewpoints on how children communicate. The researcher believes that each child communicates in their own unique way, and in order to truly understand their communication, one needs to get into ‘their world’ rather than having the child come into our world. With this being said, the researcher believes that children with autism often communicate in very subtle and idiosyncratic ways. So when working or communicating with a child with autism, one must have a keen sense of how each child communicates in order to truly understand their communicative acts.

Due to her previous experience working with children with ASD, the researcher, and her supervisor, lean towards an eclectic theoretical orientation that is deeply rooted in humanistic ideals (Abrams, 2015). Each client presents their own unique strengths and weaknesses; thus, the researcher and her supervisor approach their work with each client somewhat differently. Each client may not benefit from one specific type of approach, such a behavioral or psychodynamic orientation. Consequently, the researcher and her supervisor take concepts from each theoretical orientation and apply it when it is appropriate depending on the client. The pair's clinical work is also deeply rooted in humanistic ideals due to the humanistic concepts of client agency and viewing the client as a whole rather than individual parts (Abrams, 2015). In work with BC, the client’s agency was a huge component of his treatment. The researcher and her supervisor were able to be flexible in the treatment process in order to follow BC’s choices from moment to moment. This is one of the primary factors in the researcher previously stating that no specific treatment protocol was followed in this case study in order to allow for BC’s agency in sessions.

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It is also important to note that the current researcher was an internship student at the time of data collection; thus, the researcher's supervisor was consistently supervising the researcher in order to maintain professional and research integrity. To further negate the potential biases within this case study and to raise the study's credibility, the researcher also took other precautions throughout data analysis, such as multiple text read throughs and thematic-text discussions (DiMaio, 2019) with the researcher's supervisor.

Chapter 4

Results

Results of the Video Analysis

BC's progress in three recorded sessions 1, 4, and 8 will be described in detail, followed by the collective outcomes comparing the progress between sessions using graphs. The data between the researcher and her supervisor were averaged. Consequently, various data points in the following text and graphs will be reported in decimals. Although data may suggest that BC communicated partially due to the decimals, all tallied data was based on BC's total completion of his communicative act or total lack of a communicative act.

In the first video recorded session, BC communicated the most frequently through his AAC device, with 9.5 independent responses and 6.5 prompted responses. The client communicated the least through his vocalizations, independently vocalizing on two occasions and prompted on six occasions. BC utilized a moderate level of gestures to communicate, with eight independent and one prompted gesture. BC's total communicative responses, both independent and prompted, totaled to 33, which was the lowest total communicative response over the research period.

During the fourth video recorded session, BC's most frequent type of communication was his vocalizations, averaging 18 responses. The client's vocalizations were also his most frequent type of prompted response, with five prompted vocalizations. BC communicated independently 12 times with his AAC device and four times with his gestures. Finally, BC's total communicative responses increased to 43 responses, as compared to 33 total responses in video recorded session No. 1.

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In the last (No. 8) video recorded session, BC communicated the most frequently using his gestures, averaging 16.5 responses. BC also had the highest rate of communication with his AAC device during this session, tallying 14 independent responses and 7.5 prompted responses. Finally, his vocalizations were higher than his first session, totaling seven independent responses compared to only two during his first session. His prompted vocalizations were also less than previous sessions, with only being prompted three times during his final session, five times during Session No. 4, and six times during Session No. 1. In total, B communicated the most frequently during the last session with 48 total communicative responses.

Figure 1 presents the average of BC's independent communication responses. The average of BC's responses are categorized by his communication with his AAC device, vocalizations, and gestures. Video recorded sessions 1, 4, and 8's average responses are represented by the bar graphs located within each communication category.

Figure 1

Average of Client's Independent Communication Responses

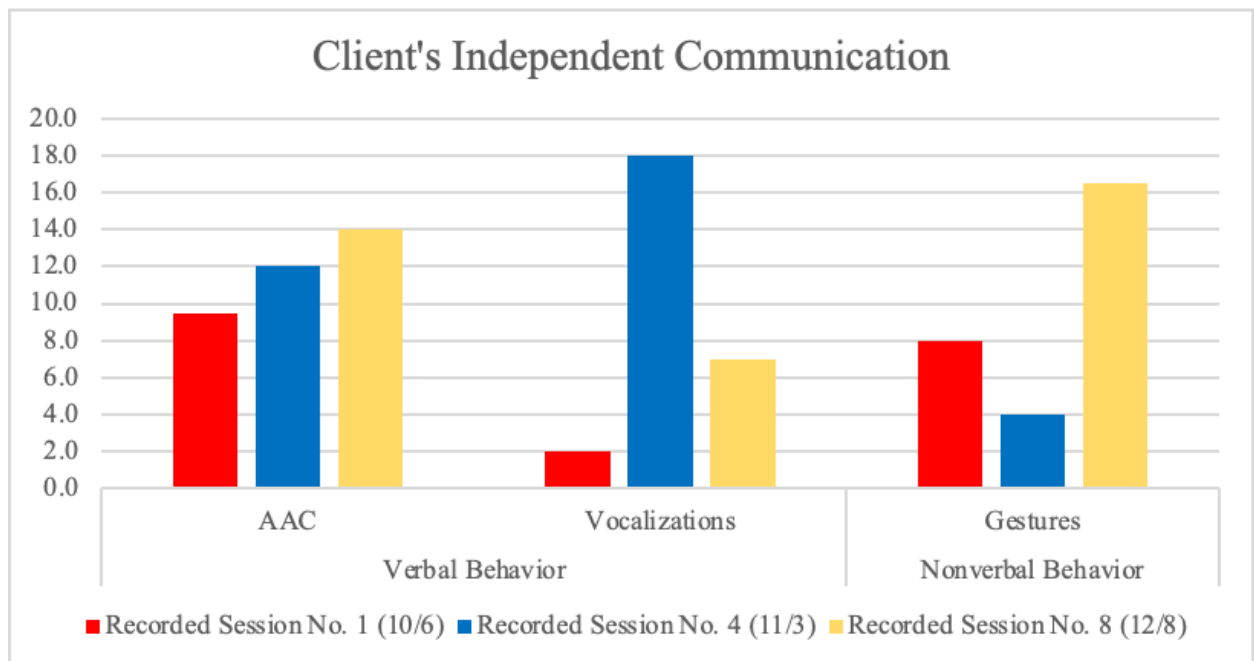
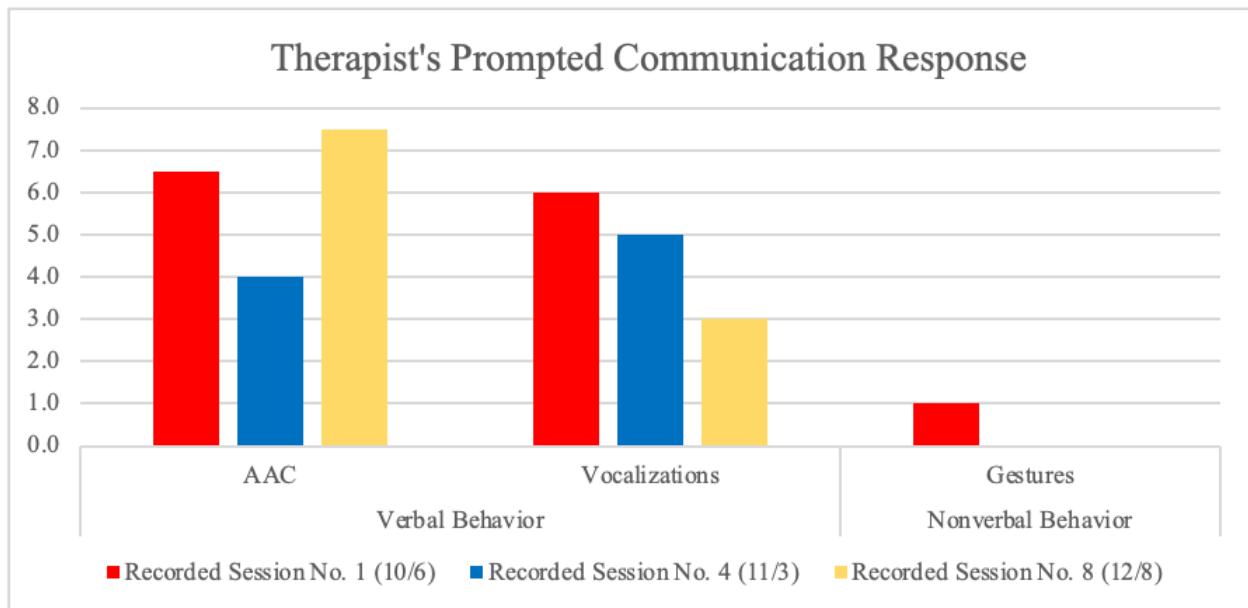


Figure 2 displays BC’s average prompted communication responses. This figure depicts the number of prompts BC needed when utilizing each type of communicative response to respond to the therapist's interaction. Similar to Figure 1, BC’s responses are categorized by prompted communication on his AAC device, vocalizations, and gestures. Video recorded sessions 1, 4, and 8’s average responses are represented by the bar graphs within each communication category.

Figure 2

Average of Therapist’s Prompted Communication Responses



As one can see by Figure 1 and 2, BC communicated both verbally and nonverbally over the course of video recorded sessions 1, 4, and 8. The client also communicated differently within each session. When examining Figure 1, one can see that the client communicated the most frequently during session 1 with his AAC device as compared to session 8 in which he communicated the most frequently with his gestures. This finding is important as it may suggest

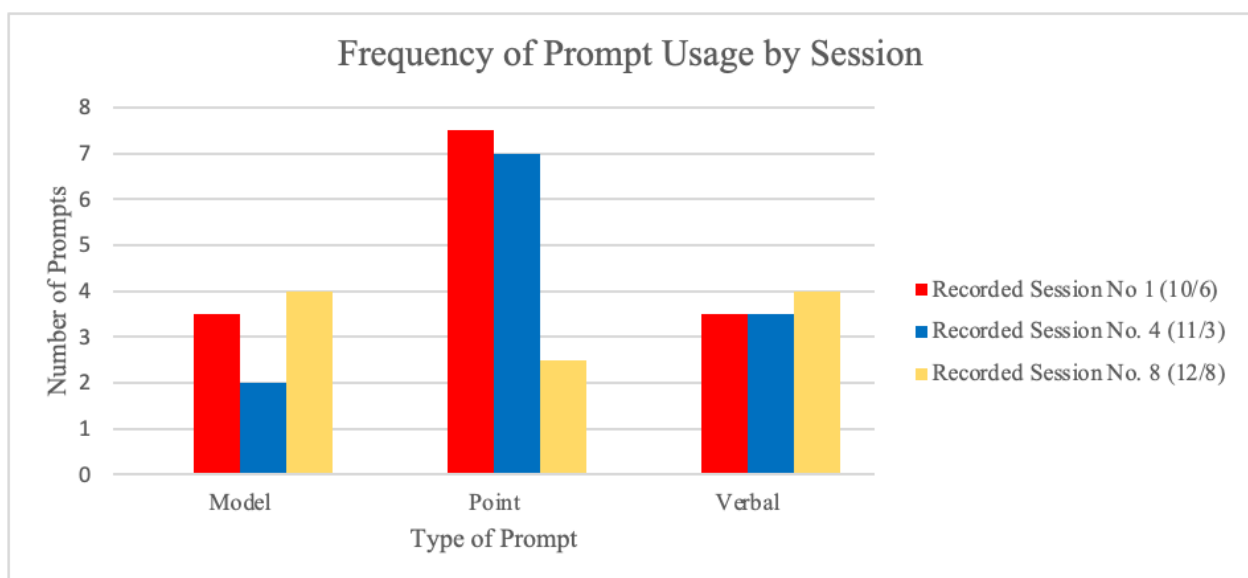
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that BC does not rely on one mode of communication; rather, BC uses both verbal and nonverbal communication interchangeably. Figure 1 also identifies a strong increase in BC's overall communication, improving from 33 responses in video recorded session 1 to 48 responses in video recorded session 8. Figure 2 represents a slight decrease in BC's reliance on prompts to communicate, decreasing from 14 total prompts in session 1 to 11 prompts in session 8. Furthermore, these results may suggest that BC could be able to effectively improve his communication goals throughout music therapy as the total number of communication responses increased, and his prompted dependency decreased over time.

As seen in Figure 3, the average prompt frequency during video recorded sessions 1, 4, and 8 are displayed. There are three categories of prompts displayed: model, point, and verbal. Each category contains the averages of prompts used during video recorded sessions 1, 4, and 8.

Figure 3

Average Prompt Frequency



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As seen in Figure 3, there were three types of prompts utilized by the researcher with BC. When referencing the data sheet in Appendix I, two types of physical prompts, full and partial, were listed as potential prompt options. From Figure 3, it can be seen that neither the researcher, nor her supervisor, noted the use of these types of prompts when working with BC. The most frequently used prompt when working with BC was a point prompt, with model and verbal prompts almost being utilized equally throughout each session. When examining the total number of prompts used, this number decreased over time. On average, the prompt frequency decreased by 2 during each session.

Inter-rater reliability

The inter-rater reliability between the researcher and her supervisor was calculated for BC's independent and prompted communicative responses. When referring to the percentages of inter-rater reliability, 100% inter-rater reliability corresponds to both raters agreeing on 100% of the responses. Conversely, 0% corresponds to both raters disagreeing on 100% of the responses. The total inter-rater reliability for all communicative responses was 27.8%. When looking at independent communicative responses, overall, the inter-rater reliability was 11.1%. The overall inter-rater reliability for prompted responses was 44.4%. Reliability for frequency and type of prompt was 0%. The inter-rater reliability differed significantly between the discussed data points. The highest inter-rater reliability occurred in the prompted nonverbal communication, with both raters agreeing 100%. Other subcategories, such as independent AAC communication and prompted AAC communication, had 0% inter-rater reliability. Potential causes for differences in the tallying of BC's communicative response, both independent and prompted, will be further discussed in Chapter 5.

Results of the Text Analysis

Session Reports and the Reflection of the Researcher

Clients who are nonverbal have different ways of communicating with those around them. It is from the researcher's experience, that those who care for and work with clients who are nonverbal have a unique insight into the intricacies of how the clients communicate. Thus the results and conclusions drawn from the researcher's session notes and personal experience with 'BC' aims to provide readers with the therapist's experience coming to learn and begin to understand how the client's communication evolved over time. Three distinctive time periods were developed during the text analysis including:

- First period: Building of Rapport in June and July 2020
- Middle period: Exploration and Developing Consistency in August and September 2020
- Final period: Blossoming in October, November, and December 2020

Building of Rapport

When examining the researcher's session notes from the beginning of BC's treatment, in June of 2020, there was a tone uncertainty. The client had just begun to be re-introduced to in-person music therapy at the start of the researcher's internship. Skills previously seen by the researcher's internship supervisor had regressed as the client had not received services for at least three months due to the pandemic. Throughout the first few session notes, the researcher and her supervisor agreed that the client's attention needed to be addressed in order to then work on his communication down the road.

Over the course of June and July, the client's attention quickly improved, and the rapport and relationship between BC, the researcher, and her supervisor improved as well. This

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improvement in rapport appeared to be aided by the researcher and her supervisor beginning to note specific nonverbal cues the client was communicating throughout the session. Evidence of this therapeutic understanding comes in a session note from the middle of June:

For the first part of the session, the client's attention was diverted to a ladder outside.

Once the therapist mentioned it to the client's mother, the ladder was put away, and the client became more attentive for the remainder of the session.

The researcher's understanding that what may seem like a simple item out of place to neurotypical individuals may inhibit or bother a client who is not neurotypical. In turn, by the researcher acknowledging this out of place item, it may have increased this client's feeling of being 'heard,' even though BC was not directly communicating with the researcher and her supervisor. The pair continued to bring in various tools that may have assisted the client in his communication. These tools included different picture tools, a schedule board, and novel instruments for BC to utilize. Sessions began to take a positive turn during the middle of July.

The latter half of this first portion of treatment with BC can be characterized as the client's first therapeutic breakthrough with the researcher. The researcher and her supervisor began to utilize the client's AAC device within the latter portion of July, prior to this BC's AAC device had not been utilized during sessions. It is clear from the session notes that the client's verbal communication began to flourish once the device was introduced to sessions. One session note reads "when presented with known items, the client speedily and readily communicated with the therapist and intern via his AAC device....". BC also began to mimic the researcher's and her supervisor's speech sounds more readily throughout recreative experiences.

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Exploration and Developing Consistency

During the middle portion of treatment, BC began to make a fair amount of therapeutic strides. He began to open up more, and his personality began to shine through during each session. The researcher and her supervisor were able to be more flexible in treatment and session flow which in turn allowed BC to take a more active role in determining what the group was going to do in sessions. This flexibility and active decision-making for the client fostered many new opportunities for the group to communicate.

Improvisational methods have been dominantly used with clients with ASD (Carpente, 2012; Edgerton, 1994; Markworth 2014; Kim, et al., 2009). For BC, improvisation was not a primary method utilized due to his initial limited interest in instrumental play. Since BC was making great strides in therapy and beginning to open up to the researcher and her supervisor, the researcher thought of non-traditional ways in which BC could engage in recreative instrument play or improvisation.

During one session, the researcher brought in her ocean drum and began to throw tiny beads on top of the ocean drum to make small ‘ping’ sounds as one of BC’s deep interests is taking toys and organizing them into certain categories, typically by colors and collecting beads. The client seemed interested, sat down next to the drum, and watched the therapist continue to non-traditionally improvise with the ocean drum by throwing beads onto it. BC then began to engage with the therapist by moving beads on the drum and throwing some beads as well. The first session in which the researcher engaged in this intervention with the client the pair improvised in this manner for five minutes, which was the longest the researcher had seen the client engage with any type of instrument. In later session notes, it also mentioned that the group

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continued to use the ocean drum to engage in short improvisations; as well as, a singing bowl was used for improvisation in which the client engaged with the bowl for at least five minutes.

These examples from the researcher's session notes demonstrate the idea that BC's middle portion of treatment can be characterized as 'exploratory' in nature. BC was willing to engage with new types of instruments, which up until this time in treatment he did not do. Additionally, BC engaged with the instruments for more than 1-2 minutes. From this, the researcher suggests that BC was becoming increasingly more comfortable with the researcher and her supervisor. Since BC felt comfortable with the researcher and supervisor, it allowed him to begin to expand his skills and therapeutic interests. This assisted the group in creating a therapeutic space in which BC could flourish and therapeutic strides became more consistent.

Consistency is a theme that can also be found within the middle portion of treatment with BC. Throughout a majority of the session notes, it was noted by the researcher that BC would consistently utilize his AAC device, vocals, and gestures when communicating with the researcher and her supervisor. Since BC had become more flexible and comfortable with the researcher and her supervisor, the researcher was able to take a more active role in teaching the client how to navigate his AAC device, and BC was more participatory during recreative interventions, using his vocals to sing along.

BC's preferred music is vast. During the middle portion of treatment, BC began to take a particular liking to *Frozen*. The group would often begin recreative interventions by singing *Frozen* songs, and BC would sing consistently throughout. The researcher also began to bring in new music to expose the client to, and BC was able to consistently use his AAC device to tell the researcher and her supervisor if he enjoyed the song or not. Since the group was making

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immense therapeutic strides, the researcher knew that she was going to be able to push the client even more during the next portion of treatment.

Blossoming

The last portion of treatment with BC is during the time period in which the researcher video recorded sessions with him. Upon looking back at the session videos and session notes, the researcher has reflected upon the immense growth BC had just during the last two months of treatment during this case study. BC readily began communicating with the researcher and her supervisor. BC's language on his AAC device began expanding besides answering 'yes' and 'no' questions. The researcher and her supervisor also noted that BC began to become more fluent in navigating his AAC device while in sessions. This continual growth provided the researcher and her supervisor with even more opportunities to challenge the client throughout sessions.

While BC was still open to exploring short improvisations with the researcher and her supervisor on various instruments, it did not appear to the researcher that this method would be the best avenue to continue to push the client in his communication skills. Additionally, BC's nonverbal communication skills, his gestures and facial expressions, were extremely refined and definitive when BC would use this modality to communicate with the researcher and her supervisor. Thus, the researcher hypothesized that using compositional methods may be the challenge that BC needs to continue his current growth trajectory.

The researcher came up with a few compositional interventions designed to increase BC's communication while also giving BC an additional outlet to self-express. Each intervention was repeated on a few occasions during the last two months of treatment. According to the session notes, initially, the researcher and her supervisor needed to provide BC with more prompts in

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order to contribute to the composition; however, by the end of treatment, BC had gained the knowledge in order to navigate his AAC device to answer questions with independence or limited prompting. Throughout each composition, BC was able to answer questions like “what is your name”, “what is your favorite toy/item to play with”, and “what does BC do when he feels sad”. In the context of the group’s composition, BC flourished with his abilities to communicate ideas about himself while also having an opportunity to express these thoughts through an active music making experience.

BC also began to blossom in terms of expansion of vocalizations. Within the past four months of treatment, BC had primarily utilized the sound “m” and did not mimic or emit any other types of consonant or vowel sounds during music therapy sessions. During this last part of treatment, BC began to imitate the researcher and her supervisor’s “o” sounds periodically throughout the sessions. Independently, BC also began to emit “e” sounds. The researcher noted that this expansion and blossoming of sounds typically were connected with BC being more comfortable and happier during sessions. Regardless, this type of progress in BC’s treatment was extremely promising.

By the end of 2020, BC’s communication skills had blossomed throughout his music therapy sessions. Initially, BC was primarily communicating through gestures and a few “m” sounds here and there. By the end of this case study treatment period, BC had grown to communicating multiple wants/needs, personal facts, and his emotions through his AAC device. The client had also expanded his vocalizations to more than one sound during a music therapy session. While in the moment, progress may have seemed slow, but, from the big picture, it is clear that BC has blossomed into a dynamic communicative partner who is still continuously growing and learning.

Chapter 5

Discussion and Conclusion

Research Question and Summary of Results

The research question for this case study was: within the context of music therapy sessions, how do the client's nonverbal and verbal behaviors change? The quantitative and qualitative results both point in a similar direction.

When looking at the quantitative data, the client's total, both independent and prompted, communication and his independent verbal and nonverbal communication behaviors increased over eight weeks. During the first video recorded session, BC communicated with the therapist on a total of 33 occasions. Throughout the fourth recorded session, BC communicated on 43 occasions, and in the final recorded session, he communicated on 48 occasions. These results indicate that BC's total communication systematically improved over the course of eight weeks.

The results of BC's independent nonverbal and verbal behaviors reveal similar findings to the results of his total communication behaviors. Nonverbally, the client's independent communication improved, with eight gestures in the first session, four in the fourth session, and 16.5 in the last session. Verbally, the client's use of his AAC increased by at least two communicative responses during each session. BC's vocalizations varied over the course of the eight weeks; however, the client's vocalizations still vastly improved, increasing from two vocalizations in the first sessions to seven during the final session.

BC's prompt dependency decreased two out of the three communicative acts. In order to communicate nonverbally, BC needed one prompt during session one as compared to no prompts during the other two sessions. Similarly, the client needed six vocalization prompts during session one and then only three prompts during the final session. AAC prompts increased over

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the course of treatment, from 6.5 prompts to 7.5 prompts over the course of treatment. In short, quantitatively BC's independent nonverbal and verbal communication behaviors did improve over the course of eight weeks within the context of music therapy sessions.

The qualitative data asserts this notion as well. While BC's treatment with the researcher was split into three thematic categories, from the text, one can conclude that BC made tremendous progress over the course of six months of treatment. Initially, BC would seldomly communicate with the researcher and her supervisor during sessions. At the end of the six months of treatment, BC readily communicated with the researcher and her supervisor by using his AAC device, vocalizations, and nonverbal behaviors.

In order to continue to add depth and weight to this case study, it is important to note that the researcher continued working with BC after the research period had ended in December 2020. At the time of writing this thesis, the researcher has continued for at least four months of treatment with BC. Previously, BC was only receiving music therapy treatment once a week. As of January 2021, BC now receives twice a week music therapy treatment for at least 45 minutes due to increased funding of the client's insurance and space in the researcher's caseload. In the opinion of the researcher, the inclusion of biweekly sessions has continued to propel BC's progress towards his goals. The client has continued to expand his language knowledge on his AAC device, and his vocalizations throughout sessions have continued to grow. Additionally, BC has begun to demonstrate new vocals throughout sessions that were not seen during the research period, such as vocalizing "ah." Finally, the client has continued to integrate his nonverbal behaviors into sessions while also using verbal behaviors, such as gesturing and vocalizing, simultaneously.

Integration with Previous Literature

The current case study investigated the marked improvements of a client's nonverbal and verbal communication in music therapy treatment. Both BC's nonverbal and verbal communication skills increased over the treatment period. While this study did not include any statistical significance in its data, what the results suggest aligns with literature published in the field.

As discussed, the combined results of this case study demonstrate an improvement in BC's communication overall. These results are consistent with literature that examined nonverbal and verbal communication together (Crowe, 2011; Edgerton, 1994). For instance, Crowe (2011) investigated the effects of music therapy on the communication behaviors of a child with autism. Results showed marked improvement in the participant's nonverbal and verbal behaviors. Crowe (2011) and the current study are both case studies; however, both pieces of research suggest that music therapy can positively impact a client's nonverbal and verbal communication.

When looking at the results of BC's progress separately, the quantitative and qualitative data suggests that BC's nonverbal communication increased over the course of treatment. The improvement in this skill area coincides with other music therapy literature. Markworth's (2014) study noted that improvisational music therapy improved client's nonverbal communication through their musical conversation skills and body language. BC's gestures were a large component of his communication throughout some sessions. The client would also simultaneously communicate with his gestures and vocalizations, utilizing both nonverbal and verbal means to communicate.

An important distinction between Markworth's (2014) study and the current case study is that Markworth heavily discussed the notion that the client's nonverbal communication mostly

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took place *in* the music. In BC's case, most of his nonverbal communication took place *outside* of the music. BC does not typically engage in instrumental or vocal music making. If BC does engage in recreative play or improvisation, it is typically in short bursts. The overall structure of music therapy provided BC with the opportunities to communicate both nonverbally and verbally, not necessarily just being *in* the music. Despite this, Markworth (2014) and the current case study provide initial evidence to suggest that clients can improve their nonverbal communication by being both *inside* and *outside* the music.

The improvement of BC's verbal communication also coincides with other literature published. Specifically, the increase in BC's vocalizations are similar to the results found in Lim and Draper's (2011) study. Both of these sources saw marked improvements in client's vocal communication, with Lim and Draper's (2011) study improving word usage and the current case study improving vocalizations. The current case study's results also reinforce Salmon-Gimmon and Elefant's (2019) findings, with their results indicating significant improvements of the client's verbal communication due to music therapy.

As identified in the review of literature, there is relatively little research published on the use of AAC systems within music therapy sessions. When narrowing the literature scope to working with clients with autism, the literature becomes even less readily available. The case study discussed within this paper is one of only a few case studies with the inclusion of an AAC device and that specifically addresses both nonverbal and verbal communication behaviors. When looking at improvements specifically in AAC communication, the initial findings of this case study do support the findings of other music therapy literature.

Gadberry's (2012) study was one of the primary influences on this case study's research question and design. The purpose of their study was to examine the inclusion of client's AAC

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systems within music therapy sessions to increase their communicative acts (Gadberry, 2012). Similarly, the current case study aimed to examine, in the context of music therapy, how the client's verbal (AAC and vocalizations) and nonverbal behavior changed over the course of treatment. Both research questions are similar in the manner in which they aim to investigate the inclusion of a client's AAC device/system on their verbal communication in sessions.

There are other additional similarities between both studies. Both Gadberry's (2012) research and the current study did not follow a strict music therapy protocol for the treatment condition, video-recorded at least two sessions with clients, and self-designed the research's assessment tool. Gadberry (2012) concluded that when clients did have their AAC systems present, their communication increased throughout sessions as compared to sessions in which client's AAC modalities were not present. While the current case study does not have the same statistical significance as Gadberry's (2012) study, the quantitative data analyzed does lean itself towards similar results as BC's verbal communication did increase over 8 weeks, with B's AAC communication consistently improving over the 8 weeks. The qualitative text analysis also supports the marked improvement of BC's AAC usage.

While there are similarities between Gadberry's (2012) study and the current case study, it is important to discuss the differences. Methodologically, Gadberry's (2012) study examined the differences in communication when AAC systems were present and not present. Comparatively, the current case study only examined potential differences in communication during the treatment period, with BC's AAC device being consistently present. Another important distinction between these two pieces of research is their inter-rater reliability. Gadberry (2012) reported that their inter-rater reliability, between themselves and one other independent observer, ranged from 83.4%-97.7%, depending on the variable observed. The current case study

had a significantly lower inter-rater reliability between the researcher and the second observer, ranging between 0%-100%, resulting in the primary limitation of this case study.

Limitations

The low inter-rater reliability should be considered one of the primary limitations of this case study. The researcher and the second observer agreed on 11.1% of BC's independent responses and 44.4% of his prompted responses. According to Jone and Brown (2016), "the general consensus for an acceptable [inter-rater reliability] percentage is that it should be at least 80%" (p.308), thus these inter-rater reliability percentages are quite low. There are a few factors which may have impacted the inter-rater reliability. One factor playing a role in these percentages is personal coding differences and observer bias. In a discussion, the researcher and her supervisor reflected upon their differences in coding. The researcher described certain scenarios in which she considered BC to be communicating. There were a handful of occasions in which the supervisor agreed with the researcher when she suggested BC was communicating, but there were other situations in which the supervisor did not agree. The supervisor later reflected that she was more reserved on tallying certain communicative responses as she knew her personal bias, which aligned with thinking that clients always communicate clearly rather than not at all. Thus, she wanted to account for her personal bias when coding the three session videos. The researcher agreed with this notion but had more definitive feelings about how and when BC did communicate as the researcher had still been working closely with BC for an additional three months.

Aside from the personal coding differences, there was a therapist bias due to the clinical nature of a case study. The researcher and her supervisor both treated BC and coded his session

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videos. Since the pair have in-depth experience with BC, there may have been situations in which the researcher and her supervisor may see different communicative acts compared to a neutral party. The researcher continued work with BC after the research period had concluded as the researcher passed their board examination and stayed on as an MT-BC with her supervisor. This continuation of solo treatment with BC may have increased the researcher's bias at the time of data analysis as her supervisor had stopped being the primary therapist in January 2021. In turn, these circumstances may be potential causes of the low inter-rater reliability.

Aspects of the case study's method may have also posed potential threats to the case study's inter-rater reliability. The coding sheet that was used by the researcher and her supervisor was designed by the researcher. It had not been previously tested or validated by other researchers or other studies. There may be more effective assessment tools in which to examine nonverbal and verbal communication. The researcher and her supervisor also coded 30-45 minute videos. These long coding sessions may have been a detriment to the inter-rater reliability due in the moment coder fatigue or the sheer amount of data that needed to be analyzed. By shortening or analyzing specific and random segments or percentages of the recorded sessions, it may increase the likelihood of obtaining a higher inter-rater reliability.

The second limitation within this study is the lack of baseline data. The type of data is utilized by researchers so the experimental data can be compared to a reference point which was taken prior to treatment and to determine if there is any significant difference once treatment is completed (Jones & Brown, 2021). For this case study, there was no baseline data collected. Video data collection occurred during the fourth through sixth months of treatment with BC. Since no baseline data was collected prior to or outside of the context of music therapy, the

improvement found in BC's communication cannot be said to only be impacted by music therapy.

Implications for Clinical Practice

With the qualitative and quantitative evidence combined, it is clear that BC made great therapeutic strides over the course of treatment for six months. As initially reflected upon in results of qualitative analysis, BC did not readily communicate with the researcher and her supervisor during the initial treatment stages. Nonverbally, BC began to communicate more with his gestures and facial expressions as treatment went on. At times, BC's nonverbal communication was integral to the researcher and her supervisor's understanding of what he was trying to tell them. If the researcher and her supervisor did not pay attention to these cues, then BC's treatment could have been negatively impacted; thus, it is important for future and current clinicians to be aware of how their clients nonverbally communicate with them during sessions.

While rapport was still being re-established due to the lapse in treatment during the pandemic, it is important to emphasize that BC's AAC device was not present during the initial two months of treatment with him. Once the client's AAC device was brought into sessions, the qualitative results showed that BC's progress towards his goals skyrocketed. This evidence positively supports the previous findings that clients who utilize AAC systems to communicate may benefit from consistently using these means of communication during sessions (Delvin & Meadows, 2019; Gadberry, 2012). Depending on the client, these results may indicate that current and future clinicians may need to integrate more of their client's AAC systems into sessions as it may lead to an increase in the client's progress towards their therapeutic goals.

Integrating a client's AAC system into a session, at times, is easier said than done. Gadberry (2011) reported in a survey of current music therapists who serve clients using AAC

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systems that only 14.6% of the music therapists always use client's AAC systems in sessions. Roberts' survey study (2012) found a slightly higher rate (23.1%) of music therapists reporting always using client's AAC modalities within sessions. Since there are so few music therapists consistently utilizing all of their client's AAC devices in sessions, it may be necessary for researchers to investigate why, which will be proposed in the following section.

Looking at communication as a whole, this case study suggests that it is important for music therapists to attend and address client's verbal and nonverbal communication skills together, if it is therapeutically indicated as it was for BC. While it was not specifically noted quantitatively, it could be inferred that BC did communicate through both nonverbal and verbal means simultaneously. His communication was not always only verbal or nonverbal. It may be beneficial for current and future music therapists to find unique ways for music therapy to address communication as a whole as was indicated for BC due to his lack of interest in improvisational or recreative play and his current skill set. It may be necessary for clinicians to specifically plan out interventions or goals/objectives that would address both areas of communication. Whether a music therapist preemptively plans for sessions or they are more fluid in nature, addressing nonverbal and verbal communication goals in music therapy allow clients to develop all aspects of their communication as compared to solely focusing on one aspect.

A final important implication for current and future clinicians is the notion that not all clients with autism benefit from improvisation. BC seldomly engaged with instruments when treatment first began, and although he made great strides towards using instruments in sessions, improvisation was not the primary method utilized by the researcher in order to address BC's goals. The bulk of music therapy literature investigating the impact of music therapy on the communication behaviors of children with autism utilize improvisation as the primary

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experimental intervention (Edgerton, 1994; Markworth, 2014; Kim et al., 2009; Salomon-Gimmon & Elefant, 2019; Porter et al., 2017). Improvisation is an effective method and provides nonverbal clients with an opportunity to communicate through a unique means; however, not all clients with autism are the same, like BC. It is important to find the best methods for each individual client, regardless of diagnosis. For BC, the most impactful methods were recreative and compositional. It was through these methods that BC began to flourish during the last couple months of treatment. So, some clients may benefit from clinicians using a wide variety of methods and interventions rather than just focusing on one.

Recommendations for Future Research

There are numerous avenues in which this case study could take future researchers. When looking at BC's communication globally, there are still some questions that are left unanswered. One primary question is how does BC's communication differ outside of a music therapy session? What does BC's communication look like within his other therapies? By examining BC's communication outside of therapy, it may lead to future research in examining more substantial quantitative data. In one case, the researcher could gather 'baseline' data of BC's communication in his home environment and then compare this data to his communication inside of therapy. Interviewing BC's family members' perceptions on his communication improvement at home would provide valuable insight as well.

Looking through a different research lens, the researcher could conduct an interdisciplinary study examining the conditions in which BC communicates in speech therapy as compared to music therapy. Investigating how speech therapists work with clients with autism may also lead to different research questions within a music therapy context. For instance, do

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speech therapists primarily focus on the verbal component of communication? Does this mean that music therapists may want to focus more on the nonverbal aspects of communication?

Another direction the current researcher or a future researcher could take the results of this case study is to examine one of the components of communication more specifically. While it is important to study both nonverbal and verbal communication skills together, more literature in music therapy is necessary on the practicality of integrating AAC modalities into sessions. Music does provide nonverbal clients with a means of communication; however, an intricate aspect of this is a client's participation *in* the music. For clients like BC, nonverbal communication *in* or *through* music can be difficult as BC does not have a deep interest in active music making. Thus for clients like BC, it may be more suitable to address his verbal communication skills through his AAC system, which was an iPad device, in music therapy.

In order to provide the field with a basis for the use of AAC systems in music therapy, a series of published case studies may be a suitable option as a foundation for continuing research. A series of case studies would allow current and future clinicians to examine the clinical work of multiple different music therapists with their clients who use AAC systems. Additionally, a research source, such as a series of case studies, may be the most economical way for more music therapists to have exposure to this type of music therapy work as compared to a formalized training. Down the road, these case studies may provide more researchers with continuing research questions brought up initially by the results of the case studies.

Conclusion

The current case study explored how a 13-year-old male with autism's improved their nonverbal and verbal communication over the course of six months' music therapy treatment.

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The quantitative results presented that music therapy positively impacted the client's nonverbal and verbal communication, with the client's frequency of communication improving throughout each recorded session. The qualitative results also yield similar findings with the client initially not communicating frequently with the researcher or her supervisor to consistently utilizing all means of communication with the researcher and her supervisor to communicate more than just his wants and needs. While there are some limitations, this case study still provides a foundational basis for future researchers in order to examine young individuals with autism communication needs, both verbally and nonverbally.

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Appendix I

Case Study Data Sheet:BC

	Verbal Behavior		Nonverbal Behavior
	AAC	Vocalizations	Gestures
Client Independent Response			
Therapist Prompted Response			

Type of Prompt	Quantity
Full Physical	
Partial Physical	
Model	
Point	
Verbal	

No. of explicit communication opportunities	
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Notes: