

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF COMMUNICATION SCIENCES AND DISORDERS

Resources for Individuals with Autism Spectrum Disorder Using Improvisational Music
and Dance Movement Therapy Techniques

GLORIA LO
SPRING 2022

A thesis
submitted in partial fulfillment
of the requirements
for baccalaureate degrees in Communication Sciences and Disorders and Musical Arts
with honors in Communication Sciences and Disorders

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ABSTRACT

Individuals with autism spectrum disorder (ASD) may experience difficulties maintaining eye gaze/contact, initiating joint attention, engaging in turn-taking, and participating in verbal and nonverbal communications. This thesis will evaluate literature that suggests that Improvisational Music Therapy (IMT) and Dance Movement Therapy (DMT) techniques may offer beneficial effects on these behaviors for individuals with ASD. This paper will review research on the effects of IMT and DMT on individuals with Autism Spectrum Disorder. In addition, the paper will provide a set of resources to serve as a general guide for SLP as a context for providing treatment. The resources will focus on providing interactive activities that promote communication through the use of music and movement.

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ACKNOWLEDGEMENTS

This paper is dedicated to students with ASD. Thank you for accepting me and laughing with me when we danced and made music together. It deeply touched my heart. I would also like to thank my thesis supervisor, Dr. Wilkinson, for her patience in guiding me through the process. Your support and guidance helped me push through this paper during tough times. I would also like to thank Dr. Miller for the additional assistance throughout the process. Lastly, I would like to thank my friends and family for their love and support.

Chapter 1

Introduction to Autism Spectrum Disorder

In the first chapter, I will be discussing the characteristics of autism spectrum disorder (ASD). In addition, I will be presenting two performing arts therapy techniques that promote behaviors that can be at risk in ASD, including turn-taking, joint-attention, imitation, and eye contact. They are techniques that naturally involve the behaviors that we are targeting, and thus offer a natural way to promote these behaviors. In the second chapter, I will evaluate literature reviews related to of Improvisational Music Therapy (IMT) and Dance/Movement Therapy (DMT) that support the use of performing arts therapy with ASD. In the third chapter, I will provide 10 activities that involve IMT and DMT techniques for future usage.

Challenges in Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that impacts an individual's communication, social interactions, and behavior (Mayo Clinic, 2018). It is currently one of the fastest growing developmental disorders. As of 2016, the prevalence rate of ASD was around 18.5% compared to 6.7% in 2000. Based on CDC's most recent data, 1 out of every 54 children will be diagnosed with ASD (CDC, 2021). Although ASD impacts individuals regardless of race, ethnicity and economic status, boys are 4 times more likely to be diagnosed with ASD than girls.

The disorder is known as a spectrum due to the wide variation in type and severity of symptoms (National Institute of Mental Health, 2022). According to the US. Department of

Health and Human Services, the learning, thinking, and problem-solving abilities of people with ASD can range from gifted to severely challenged (U.S. Department of Health and Human Services, 2017). For example, some individuals with ASD can develop language at a typical rate and display language skills at a very high level while others have little to no verbal communication (National Institute of Deafness and Other Communication Disorders, 2020).

No two individuals with ASD face the same challenges, however, there are clear diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (American Psychiatric Association, 2013). The criteria state that individuals must show deficits in social communication, such as joint attention, eye gaze, turn-taking, and other social reciprocity. In addition, some of the social communication deficits include challenges in using verbal and nonverbal communication. The diagnostic criteria also include symptoms of restrictive and repetitive patterns of behavior, speech, activities, and motor movements (American Psychiatric Association, 2013).

Social Communication

Social communication is the use of language in a social setting. It is a form of communication that includes nonverbal skills, social interaction, social cognition, pragmatics, and language processing (ASHA, nd). There are many unwritten rules in social communication. It requires the ability to understand and use appropriate eye contact, facial expression, and body language in different social situations (Children's Minnesota Organization, 2021). For individuals with ASD, it is common to see a lack of eye contact and turn-taking behaviors (Edgerton, 1994). The interruption of conversation from the lack of turn-taking may cause

difficulties in maintaining and manipulating the topic of conversation. Individuals with ASD may also show difficulty in understanding verbal or nonverbal cues. For example, it may be difficult to absorb all gestures, signs, and speech while lacking eye contact and attention during a conversation (Children's Minnesota Organization, 2021).

Joint Attention

One of the most important components of social communication is joint attention. Joint attention is when one person purposefully coordinates and shares their attention with another person (University of North Carolina School of Medicine [UNC School of Medicine], 2021). It involves both parties focusing on the same thing, such as staying on the same topic of conversation or looking at the same object (Lee & Schertz, 2020). Not only does it require the focus of each other, but also the shared understanding between the two individuals. Joint attention is needed for any form of conversation; however, people with ASD may have a hard time maintaining their focus for an extended period of time (Dawson et al., 2004). Delayed development of joint attention skills can lead to delay in language development. Children with autism with language delays tend to have less enjoyable social and academic experiences (UNC School of Medicine, 2021). A survey by Rotheram-Fuller and colleagues in 2010 studied the difference in establishing and maintaining childhood friendships with 79 children with ASD and 79 typically developing children. The participants were matched on gender and had a mean age of 8.11. The survey showed that children with ASD had fewer reciprocated friendships and were more likely to be placed on the outer edge of social relationships and classroom interactions (Rotheram-Fuller, 2010). In addition, a study by Finke and colleagues (2019) found similar

results. The survey was designed to investigate the perspectives on the friendship of young adults with and without ASD. Nearly 60% of 125 individuals with ASD expressed that they were not satisfied with the number of friends they have. However, only 18% of 125 participants without ASD reported the same dissatisfaction with the number of friends they have. The difference in viewpoint on participation and the presence of two people may have affected the relationship of people with ASD (Finke et al., 2019).

Turn-taking

Another crucial element in social communication is turn-taking. Turn-taking is a form of social reciprocity. It involves a mutual back-and-forth communication exchange between two parties (Lee & Schertz, 2021). The purpose of turn-taking is to initiate and respond to socially-oriented interactions appropriately. The process does not have to rely on verbal or physical cues from the other person (Lee & Schertz, 2020). For example, a child will push a toy car to their caregiver. Then the caregiver would push the toy car back. The exchange of the toy car would repeat several times (Dromi, 1993). In a longitudinal study, Chiang and Soong (2008) measured and rated turn-taking behaviors of 104 children and infants. The score was determined by the frequency of taking turns sharing an object between the tester and participant. Participants who maintained multiple and consecutive turn-taking behaviors were given the highest score of 4. A score of zero was given to participants that presented no turn-taking behaviors. The children with autism tended to engage in fewer turn-taking social interactions when compared with children with typical development (Chiang et al., 2008).

Eye gaze/Contact

In most social interactions, eye contact is an important component of non-verbal communication. Maintaining eye contact during a social interaction presents the signal that the other party is attending and processing the information (Falck-Ytter et al., 2014). Most collaborative communication often involves face-to-face interaction (Kaplan et al. 2009). Lack of eye contact can affect different forms of social communication such as turn-taking and joint attention. With a camera, Falck-Ytter captured and studied the eye gaze performance during face-to-face communication of typically developing children and children with ASD. In the study, 13 young participants with ASD showed significantly reduced frequency of looking at the instructor's face during interactions. In addition, participants with ASD spent less time looking at the instructor when compared to typically developing participants (Falck-Ytter, 2015).

Imitation

Imitation serves an important role in social and communicative functions. While pursuing the same goals, the partners would copy others' actions and behaviors to show social engagement, understanding, and connectedness (Vivanti & Hamilton, 2014). Lower frequency and accuracy of imitation behaviors may negatively affect peer interactions and communication (Ingersoll, 2008). For example, when a child makes a heart shape with their arms to a friend, the friend would be expected to reciprocate and create the same movements to show social closeness. However, studies have documented a lower frequency of imitation behaviors in children with ASD (Vivanti & Hamilton, 2014). Lower frequency and accuracy of imitating behaviors may negatively affect peer interactions and communication (Ingersoll, 2008). Taheri

and colleagues (2021) compared imitation performances between 20 participants with ASD and 20 typically developing participants. Through imitation games of imitating movement from a robot and adult human, participants with ASD showed lower scores in imitating gross movements when compared to typically developing participants (Taheri et al., 2021).

Improvisational Music/Dance Movement Therapy Addressing Challenges in ASD

Music therapy promotes self-expression, social skills, communication abilities, and motor skills (AMTA, 2012). Improvisational music therapy (IMT) serves as an additional form of therapy through the use of live music (Hall, 2018). During the session, the therapist will identify musical instruments and elements that suit the individual's needs (Wigram, 2004). The use of a variety of music stimuli, such as percussion, singing, clapping, rhythm exercise, movement, and dancing, encourages the individuals with ASD to engage in the session (Hall, 2018). Some individuals may show an interest in a particular timbre or pitch range; other individuals may enjoy the rhythmic patterns, melody, or harmony (Wigram, 2004). As individuals with ASD often show restricted and repetitive behaviors, IMT facilitates a safe environment for musical improvisation (Salomon-Gimmon & Elefant, 2019). Salomon-Gimmon and Elefant (2019) report a case study of four children who received music therapy sessions for 5 months. The goal of the session was to investigate the patterns of vocal development and help them gain the flexibility to deal with unexpected situations in their daily lives. In the results, they recorded increased vocal communication in all four participants after receiving improvisational music therapy sessions (Salomon-Gimmon & Elefant, 2019). Along with creating, singing, listening, and dancing to

music, IMT provides multiple opportunities to practice social skills, communication skills, and reduce repetitive behaviors (Adamek et al., 2008).

The word “communicate” means to express and convey thoughts, ideas, and feelings to others. People communicate through their voices and writings, such as talking on the phone or texting a friend. They also share visual and artistic properties, such as expressing emotions and ideas through paintings or music. Dance is communication through movement as our body movements can tell a story, show emotions, and interact with others. Dancing can not only serve as a communication method but also as a chance to promote social interactions and decrease repetitive behavior for children with ASD (Scharoun et al., 2014). According to the American Dance Therapy Association, dance movement therapy (DMT) is the psychotherapeutic use of movement to further the cognitive, physical, and social integration of the individual. DMT incorporates the Body, Energy, Space, and Time elements of dance known as BEST (Nelson et al., 2017). Alongside the dance therapist, children with ASD are encouraged to explore the BEST elements to learn about movement, rhythm, tempo, balance, tension, and force through DMT.

Chapter 2

Literature Reviews

The following section includes five in-depth reviews of literature regarding improvisational music therapy (IMT) and dance/movement therapy (DMT) with individuals with ASD. Three of the articles addressed the potential benefits of IMT, the remaining reviews address the positive effects of DMT. As IMT and DMT are not widely studied with individuals with ASD, there is a limited selection of research. All studies used a small sample size, most without a randomized sampling of the participants. However, the converging evidence suggests that improvement can occur in areas of sharing attention, maintaining eye contact, expressing themselves in verbal or nonverbal ways, and initiating social communication and turn-taking behaviors. After the literature review, I will provide a set of resources of DMT and IMT activities to use in therapy.

Research Related to Improvisational Music Therapy

In 1994, Edgerton evaluated the effectiveness of IMT in helping individuals with ASD develop skills for social communication. The participants in Edgerton's study showed positive effects from the use of improvised music therapy. Individuals with autism in the studies showed increase attention span, use of self-expression, spontaneous speech, vocal imitation, and development in other skills. The instrumental and vocal improvisation served as a bridge for communication between the therapist and the child with autism.

Edgerton proposed five questions to examine the effects of IMT on the communication behaviors of children with ASD. The individuals' musical and nonmusical communicative

behaviors were measured with the Communicative Responses/Acts Score Sheet (CRASS). The first question aimed to determine if there is a significant difference in the number of communicative behaviors between the first and last IMT sessions. The second question was to determine if there was a significant difference in the subcategories of tempo, pitch, rhythm, structure, speech production, communicative intent, and communicative interaction of the CRASS between the first and last session. The third question identified if there was a significant relationship between the individuals' musical vocal behaviors and their nonmusical speech production score. The fourth question included the parents, teachers, or speech-language pathologists' observation of any changes in the communicative, social, emotional, and musical behaviors over ten-week. Lastly, the final question was to determine if there was a significant relationship of the overall CRASS score changes and the Behavior Change Survey rated by the parents, teachers, or speech-language pathologists.

There were a total of 11 participants in the study. Their ages ranged between 6-9 years old. All participants were diagnosed with ASD ranging from severe to mild. Five of the participants were nonverbal, while four of them showed limited functional language skills. It was reported that the participants had the language age ranging from no intentional communication to 5 years by the standardized test or from the observation of their teachers and speech-language pathologists.

The study was conducted in three different rooms. Two elementary school classrooms that were similar in size and content; however, the music therapy clinic was a larger music education room. It contained more musical materials and instruments, including a piano, a snare drum without the snares, and a 16-inch cymbal in the treatment process. There were also multiple drumsticks, tympani mallets, and one pair of brushes as the beaters. The drums were

mounted on adjustable stands with heights and angles to accommodate the child for a successful drumming session. A chair was provided for the child while the experimenter was seated on the piano bench. Although there were a few unanticipated interruptions, the child and the experimenter were left alone in the rooms during the session. A video camera recorded the entire session.

As there was no specific standardized exam that suited the experiment, Edgerton developed the original checklist of CRASS. CRASS is based on a series of rating scales to assess the musical and nonmusical communicative behaviors of individuals with ASD. Under the musical category, tempo, rhythm, structure/form, and pitch were measured. The nonmusical section measured the speech production skills, communicative-interactive skills, and communicative intent skills.

While being videotaped for data collection purpose, one 10-minute interval during the 30-minute session was randomly selected for sample. Two senior undergraduate music therapy students would give a check mark for each observed behavior. At the end of the session, the check marks were tallied, and the score represents the total CRASS score for the participants in the session. The second measurement tool was the Behavior Change Survey. Immediately after the study, parents, teachers, and speech-language pathologists provided ratings on 20 questions. The questions asked about the communicative, social/emotional, and musical behaviors.

All participants scored higher in the posttest for both musical vocal behaviors and nonmusical speech production on the CRASS. The results indicated an increase in musical vocal behaviors and nonmusical speech production behaviors. Of the four modalities, the participants used tempo most frequently. Tempo consisted of beating/vocalizing to a steady beat or matching tempo variation. It served as a communicative modality that children with autism could

experience success in communication due to their fundamentally rhythmic and repetitive behavior. The second interpretation is due to the synchrony between the drummer and music. The action may facilitate communication through music as the participants synchronize their drum beating. The musical synchrony could have helped create a sense of awareness, control over the environment, and a new way of communication. As for the next modality, all 11 subjects made gains in pitch. The last modality of structure/form gained the least ratings. Overall, there is a significant correlation coefficient as musical vocal behaviors gain the nonmusical speech production behaviors also increased.

With the Behavior Change Survey, the 11 parents, four teachers, and two speech-language pathologists recorded a scores between 4 and 5, which indicated a slight change in all categories. The parents recorded the highest scores ($M=4.8$), while teachers ($M=4.7$) and speech therapists ($M=4.2$) recorded lower scores in all categories.

The results suggested IMT is effective in eliciting and increasing communicative behaviors in children with autism within a musical setting. In addition, the study showed that children with autism can benefit even with low-structured intervention. The flexible and spontaneous experiences provide the opportunities to communicate in different modalities

Kim, Wigram, and Gold (2008) investigated how IMT affects social communication in children with ASD. Through observing the participants, the study measured emotional, motivational, interpersonal responsiveness between the child and the therapist. As children with autism experience difficulties in engaging with others in social situations, the researchers proposed the use of IMT to directly address the emotional expression function of communication. Through a shared music-making process, the music therapist and client used the opportunity to establish a meaningful relationship. Within the process, the therapist identified

five musical elements (temporal beat, rhythmic patterns, dynamics, pitch range, and melodic lines) and utilized the music and non-musical behavior of the child to create a supportive, empathic, and predictable system to engage the child.

Children between the ages of 3 and 5 years were recruited from the Department of Child and Adolescent Psychiatry at Seoul National University Hospital (SNUH), Korea. SNUH informed the parents of the research project and provided contact details to the first author. Eighteen children qualified for the trials. None of the children had never been treated with either music therapy or plays therapy. In addition, verification of an ASD diagnosis for each child was conducted using the DSM-IV-TR criteria by a senior child and adolescent psychiatrist at SNUH. Due to long-distance travel and other health problems, only 10 participants (male) continued with the study at the end.

The children presented with varying levels of language skills. Five of the participants were nonverbal, while the others showed diverse language skills. Eight of the participants attended preschool with special education. The remaining two participants went to a mainstream preschool program that included additional speech-language therapy and cognitive and behavioral therapy. The difference in language skills and educational background was considered during the trials in the intervention phase.

The researchers used a repeated measure, within-subject comparison design. Each child participated in toy play sessions and improvisational music therapy sessions for 30 minutes for 12 consecutive weeks. To prevent therapist bias and personal familiarity from influencing the outcome, each trial was conducted by a different therapist. The order of engaging in music or toy play therapy session were randomly assigned. There was a one-week washout period for the transition between the two therapy conditions.

Every session started after a greeting between the child and therapist. After the greeting, the sessions proceeded in two parts. The first part consisted of undirected, child-led play. The second half consisted of the therapist leading the session. During the first section, the child was free to play the way they wanted while the therapist supported and reinforced their activities. As for the second part, the therapist guided and directed the child by modelling and initiating turn-taking activities. Whenever the child became anxious, tired, or frustrated by the activities, the child was allowed to rest and do whatever they wanted for a short period. Afterwards, the therapist gently reintroduced the structured play that focuses on the child's attention, range of interests, and level of tolerance. At the end of the sessions, the therapist and child conducted a 15 minute goodbye ritual.

The entire study took 7-8 months to complete two types of therapy for comparison. To determine the difference between toy play therapy and IMT, the therapist was instructed to avoid any musical interaction during the toy play sessions. In the toy play therapy, there were no musical instruments provided for the child and therapist. The child had a dollhouse set, toy vehicles, Lego block sets, sets of play dough, and other toys, while the music therapist was instructed to only engage mainly in musical media, such as singing or rhythmic playing. The child was provided with an upright piano, drums, color tone bars, cymbals, and shakers.

The researchers gathered the data through the Pervasive Developmental Disorder Behavior Inventory- C (PDDBI; Cohen & Subhalter, 1999) and Early Social Communication Scales (ESCS; Mundy et al., 2003). The measurements were used before, during, and post-treatment measures. There were two versions of the PDDBI for the teachers and parents to rate their child's interactions. The first component was to rate the child's responsiveness to interventions. For the next section, parents and professionals would score the joint-attention

skills and pro-social behaviors in the children. For the ESCS, the scores measure the non-verbal social communication skills during structured toy play sessions. It provided scores in initiating joint attention (IJA) and responding to joint attention (RJA). IJA grading was split into two grades: low-level behavior (making/alternating eye contact between toy and tester) and high-level behavior (pointing, showing gestures, the child is showing the intention of sharing the share toy/experience with tester).

In the results, the researchers compared the effects of toy and music therapy. In addition, they compared the results of directed and undirected music therapy. They found a significant effect on emotional and motivational responsiveness when comparing music therapy with toy play therapy. Between the two types of music therapy sessions, participants showed more joy reactions, such as smiling and laughing in undirected than directed music therapy. The frequency of joy behavior steadily increased over the sessions in music therapy, while the toy play session recorded a slight increase in both directed and undirected parts. There was also a significant effect on emotional synchronicity in both music therapy sessions. To provide the most reliable records, the researchers only used events that showed clear emotional synchronicity. For example, when the child and therapist simultaneously smile, laugh, or share facial, gestural, and vocal expressions.

Overall, the duration of eye contact was longer in music therapy sessions. Participants initiated activities more frequently in music therapy than toy play. The team also recorded more initiations during undirected parts of the session in both music therapy and toy play. As for the effect on responsiveness, the participants showed the highest level of engagement in undirected music therapy. In addition, the researchers recorded more compliant behaviors during music therapy sessions. In summary, the study suggested that IMT is more effective at promoting

emotional development, joint attention, and non-verbal social communication skills than toy play sessions. The data showed that the children and therapist maintained longer periods of eye contact in IMT sessions. In addition, the children were more responsive and engaged with the therapist.

Silverman (2008) provided a literature review of the use of music therapy and a case study of a 29-year-old woman diagnosed with autism. The patient was nonverbal and did not use American Sign Language or other forms of augmentative communication. The family was minimally involved in Michelle's care, and the caretaker knew little about Michelle's history. However, the patient had previously had some music therapy sessions. After assessing Michelle's communication methods, Silverman noted that she showed a deficiency in eye contact and vocalization. In addition, Silverman found the electric keyboard to be Michelle's preferred instrument.

Along with the music therapist, Silverman recorded and analyzed Michelle's communication behaviors. As Michelle would typically avoid physical contact, Silverman would note the initiation of communication if Michelle prompted direct physical touch. Silverman also recorded Michelle's nonverbal communications and reciprocated her actions. Whenever Michelle pointed towards an object, Silverman would interpret it as her way of communicating through gestures. He also met her needs whenever she requested an item or activity. She smiled, nodded her head, or rubbed her stomach to show happiness or contentment. For example, after playing the keyboard for a while, Michelle looked towards Silverman and shook her head to show approval to let Silverman to play. Michelle also widened her eyes to show acceptance. In reciprocation, Silverman widened his eyes as well. To address turn-taking behaviors, the pair traded musical measures on the instruments. Silverman would expand and imitated Michelle's

playing. In response, Michelle expanded her range and expressivity. She was able to express herself through keyboard playing and interactions with Silverman.

Silverman (2008) suggested that he saw Michelle's improvement with eye contact, vocalization, turn-taking, and self-expression. By the end of the case study, Michelle held eye contact for five-second intervals on three of the five attempts. In addition, she began some vocalization during the sessions and expressed herself through keyboard improvisation and interactions with the therapists. Silverman believed that music therapy seems to have improved the patient's quality of life and social development. However, the results of a single case study may not provide the same results across other people with ASD, and the case study was primarily Silverman's perceptions of Michelle's behavior. Additional research with more participants and other quantitative measures is needed.

Research Related to Dance Movement Therapy

Koch and her colleagues (2014) examined the effects of mirroring activities from the dance movement therapy (DMT) techniques through a group study with a treatment and control group. The goal of the study was to address if dance movement therapy is an effective and feasible way to promote body awareness, social skills, self-other distinction, empathy, and psychological well-being. Body awareness is the understanding and execution of motor functions such as imitation, mirroring movements. Self-other distinction is the process of recognizing the boundaries of oneself and others. Through pretest, posttest survey, and observational notes from therapists, the participants in the intervention group reported improvement of body awareness, self-other distinction, general well-being, and social skills.

As individuals with ASD are generable able to use their bodies to communicate, mirroring was the major DMT technique that was used in the study. The mirroring technique is a two-sided process that requires attunement and imitation of body movement. The activity focuses on developing a mutual relationship between the client and therapist. Through the interactions of the therapist and client, such as adjusting tension level, tension patterns, and shape flow, the clients showed improvement in establishing advanced forms of intersubjectivity.

A total of 31 adults with ASD were recruited, who ranged in age from 16-to 47, with 23 men and 8 women participating. According to the International Classification of Disorders- 10th Revision (ICD-10), all participants were diagnosed with ASD. The patient's clinician determined that six patients presented severe symptoms of ASD, 15 with moderate, and three with a mild degree of ASD. There were two groups in the study, one group was the treatment group while the other was the control group that received no therapy intervention. The participants were not randomly assigned as they were matched according to sex, age, and severity of diagnosis by their primary therapist or physicians.

The study was conducted by a dance movement therapist. There was a total of seven sessions of 1-hour manualized intervention activities. Every session had the same sequence of mirroring exercises and a verbal processing part at the end. The first section consists of a warm-up called the Chace-circle. The participants formed a loose circle. Then, the therapist picked up the action and asked the participants to try out a movement. For example, the therapist may ask the group to follow one of the participants' moves. The therapist would also playfully change the dynamic by suggesting the group make their actions bigger, smaller, or softer. After creating a safe atmosphere where the participants felt accepted and safe to express their feelings and thoughts, the group moved on to the next section.

The Dyadic movement section consisted of one therapist/assistant with one participant. The participant has a choice to choose their preferred partners in the process. Then, the therapist explained that the participant may lead the activity during the first song, and the therapist/assistant would follow. As for the second song, the participant switched roles and asked the participant to follow the therapist's lead. Finally, the pair would move freely while staying in contact with each other. The goal of the Dyadic section was to emphasize reflecting and connecting with their partner's movement.

The Baum circle is the third part of the intervention activities. All participants would return and form a circle. For the next section, the participants were encouraged to bring their own music. With the music in the background, the first volunteer would initiate movement to their music. The therapist would encourage and ask the participant to focus on expressing their feelings. For the last step, the group would follow the volunteer and build a sense of togetherness through the process. The goal of the Baum circle was to establish empathy and rapport through physical and emotional attunement between the participants.

For the last section, all participants gather to reflect on the session. The discussion was led by the therapist and would encourage the participants to express their feelings and opinions about the session. In addition, the participants would reflect on their perceptions and feelings when moving with another person. The goal of the discussion is to improve the session to increase body awareness, self-awareness, awareness of others, empathy, social skills. The process also allows the participants to verbally communicate their experiences and feelings.

Prior to study, the participants completed a pretest questionnaire. On a scale of 1 to 6, they rated their body awareness, self-other awareness, empathy, social skills, and psychological well-being. After the last intervention session, participants immediately took the posttest to

compare to the pretest results. In addition to questionnaires, the therapist and assistants would note the participant's preference to lead or follow. They also noted the level of fun and joy the participant was experiencing during the mirroring activities through the self-reported scores in the questionnaire. Moreover, participants were provided the opportunity to share their feelings through poems and paintings for additional qualitative data.

An overall positive effect of DMT on individuals with autism was observed. The data concluded that the individuals in the treatment group showed improvement in body awareness, self-other awareness, social skills, and psychological well-being. Scores in four areas were significantly higher in the posttest results from the questionnaire in the treatment group. In addition, the qualitative data from the therapists' observation supported the improvement and scores of the posttest survey results of the treatment group. The treatment group showed an increase in using nonverbal communication with their body and more frequent participation. There were no significant changes in the posttest scores in all four areas of the control group. Moreover, there were no significant differences in empathy between the treatment and control groups. It is possible that the DMT activities were not primarily targeting empathy; therefore, there was no significant improvement. Overall, 13 out of 16 participants found the intervention useful and would return to continue therapy.

Mateos-Moreno and Atencia-Doña (2013) studied and analyzed the potential effects of combined dance/movement and music therapy on young adults with autism spectrum disorder. As DMT and music therapy (MT) are often used separately for prevention or rehabilitation care, the study aimed to provide evidence in showing the effects of the combined use of combined DMT and MT. The study had two goals; first, to assess the effectiveness of the combined therapy through the Revised Clinical Scale for the Evaluation of Autistic behaviors (ECA-R), and

second, to determine the effectiveness of different areas from the subscales of the ECA-R. The data suggested that combined dance/movement and music therapy may be effective for individuals diagnosed with severe autism.

There were 16 participants from one care center. The individuals were selected by the staff of the care center, and were monitored continuously throughout the study. All participants were diagnosed with severe ASD by an independent psychiatrist specializing in ASD. The psychiatrist followed the guidelines from the Structured Clinical Interview for Axis I DSM-IV Disorders. The 16 participants were split evenly into an experimental and a control group. The mean age of the experimental group was 25, with seven males and one female. The control group had an average age of 25.62, with eight males. All participants had limited musical or dance backgrounds.

The experimental group received an intervention procedure that included dance/movement and music therapy. On the other hand, the control group only received traditional therapy from the care center. There were 36 sessions of combined MT and DMT therapy. The participants met up with the researchers and therapists two days per week for an hour. Along with a music therapist and a dance-accredited therapist, three assistants were occupying the participants from self-stimulatory distracting behaviors.

There were eight varied MT and DMT activities. The participants were allowed to play with dolls, hoops, boards, drums, and tambourines. The main theme was to provide opportunities to dance, sing, play with instruments, and mimic movements. The MT component included activities when the participants sat in a circle and beating to the tempo with different percussive instruments. Sometimes, there was no background music; however, songs with lyrics and feelings may be incorporated into the sessions. To foster engagement, the music was carefully

chosen or changed to fit the current environment and mood. Classical music was always present in the room whenever the participants were entering, sitting, or leaving.

DMT components of the sessions involved role-playing, dancing, or imitating movements. During some sessions, the participants were asked to massage the back of their classmates with a small ball. In addition, they were asked to change their static position throughout the activity. The participants were also encouraged to imagine stimulating situations such as flapping their arms like a flying bird or swimming like a fish. Other sessions included role-playing characters from familiar stories. Participants were also asked to show and mimic the emotions that the characters would be experiencing during a particular scene. With selected music in the background, the participants danced individually or with partners and different groups. The dancers would imagine and were encouraged to move as a 'flamenco' dancer, draw letters in the air, or play with a ball while moving. Typically, the sessions were split into halves for MT and DMT.

Data were gathered through the Revised Clinical Scale for the Evaluation of Autistic Behavior (ECA-R). The scale measures the efficacy of MT and DMT treatment on the fundamental and frequently associated symptoms. There were eight measurements throughout the study, recorded every three weeks. Two experienced clinician psychologists rate the items as they periodically observed the sessions. Afterward, the team met to discuss disagreements and provide a more appropriate score for the study. In addition, the measurements provided an overall score that corresponds to the behaviors. There were also individual scores of the 12 areas that were assessed. The 12 areas were defined as; attention (lack of focus and easily distracted); perception (poor eye contact, unusual responses to stimulus and body contact); association (inappropriate behaviors to inanimate objects or dolls); intention (lack of initiation and

participation in activity, show of agitation, restlessness, and compulsivity); muscle tone (poor muscle tone); motility (unusual posture and movements); imitation (no signs of imitation of gestures, voice, or shared emotions); emotion (frustration, mood difficulties, and resistance to changes); instinct (sleep disturbances); contact (Ignoring social connection and interaction); communication (lack of verbal, gestural, and facial expression); and regulation (behavioral variability).

There was a statically significant difference between the treatment and control groups in the posttest scores of the ECA-R. From the 12 areas of the individual components, the participants showed the most improvement on regulation/behavior variability, imitation, instinctive function, and emotions. Throughout the sessions, participants were positively affected by DMT and MT as they utilized self-adaptive behaviors, shared emotions, imitated gestures, improved sleep behaviors, and increased intolerance to changes.

In summary, DMT and IMT activities provided potential benefits that promote joint attention, imitation, turn-taking, and eye contact. In multiple surveys and studies, participants reported a longer duration of maintaining eye contact and increased frequency of turn-taking and joint-attention behaviors. In addition, most participants agreed DMT and IMT helped promote the use of imitation during sessions.

Chapter 3

Activities

Given the potential benefits of Improvisational Music Therapy and Dance/Movement Therapy, I now provide 10 activities that involve IMT and DMT techniques. The activities target social communication, turn-taking, eye contact, imitation, and joint attention behaviors as inspired by the research above.

Activity 1:

Name: Pass the Clap

Group size: 3+

Summary: The activity provides the opportunity to initiate and maintain joint attention as the participants are attempting to clap at the same time with their hands. The partners will maintain eye contact as their means of communication and watch their partners' movements.

Structure of the activity: All participants will gather around to form a circle. Next, one player will volunteer to pass the clap to the person on their right. After the first player turns to their partner, they will make eye contact and move their hands slowly to clap. The goal is to clap at the same time with their partner without verbal communication. Participants must watch their partner and learn to adjust their speeds. Once the first player passed the clap to the second player, the second player will turn to their right and pass the clap to the next person.

Goals supported by the activity:

1. Initiating and engaging in joint attention (sharing clapping motion of the hand)
2. Maintaining eye contact (providing signal as to when the clap will happen)
3. Facilitating hand-eye coordination (receiving and handing off the clap)
4. Promoting the use of nonverbal language (giving body cues as to when the clap will happen)



Figure 1: Two individuals clapping together at the same time

Activity 2:

Name: Dance and Pose!

Group size: 6+

Summary: The activity allows the participants to explore their body movements and practice working in small groups. Through initiating shared attention, the participants form groups and maintain their attention while making similar poses.

Structure of the activity: All participants will scatter through the room at the beginning of the activity. Similar to the musical chairs game, players are free to dance and roam around the room while the music plays in the background. Once the music stops, all the participants must find and form a group of 2-4 players. When standing as a group, players in the same group will strike a similar pose. When the music returns, all participants are free to dance and walk around the room again. The alteration between slow and fast songs is preferred as the participants may explore different movements through the music

Goals supported by the activity:

1. Initiating and engaging shared attention (forming groups and poses)
2. Facilitating hand-eye coordination (creating similar poses as group members)
3. Promoting imitation (mimicking group poses)
4. Practicing motor movements (exploring body movements through different music)



Figure 2: Two individual dancing and striking a similar pose to one another

Activity 3:

Name: Character Walk

Group size: 6+

Summary: While taking turns, the participants will use their body and facial gestures to pretend to be a character. The activity promotes nonverbal communication and turn-taking behaviors.

Structure of the activity: Before the start of the game, all participants will gather around and share with the instructor or therapist of characters/animals they would like to pretend. After compiling a list of characters, all participants in the room will be split into 3-5 lanes. The therapist or instructor will announce the character and ask the first person in the line to walk like a model, pirate, snake, scuba diver, ballerina, or butterfly. While taking turns, the next group of participants will begin their walks after the first group has reached the end of the room.

Goals supported by the activity:

1. Promoting turn-taking (forming lines to prepare for the walk)
2. Practicing motor movements (exploring body movements through different characters)
3. Facilitating the use of facial gestures (recreating character's features and emotions)



Figure 3: Individual pretending to be a ballerina

Activity 4:

Name: Follow the Leader

Group size: 6+

Summary: The activity provides the opportunity to take turns creating movements with their upper body. In addition, the participants engage in joint attention to recreate the movements with the leader.

Structure of the activity: All players will stand closely with one another while having space to move their upper torso. One volunteer will face the group and stand at the front. The volunteer will then create a movement with their upper body. For example, the volunteer may flap their arms, wave their hands, close and open their palms, or move their head around. The rest of the group will follow the movements of the volunteer and take turns being the leader.

Goals supported by the activity:

1. Initiating and engaging in joint attention (watching and following upper body motions)
2. Promoting turn-taking (sharing roles between follower and leader)
3. Facilitating hand-eye coordination (coordinating movements while watching the leader)
4. Practicing motor movements (exploring and creating body movements)
5. Promoting imitation (mimicking group body movements)



Figure 4: A group of participants following one another

Activity 5:

Name: I Got Rhythm

Group size: 4+

Summary: Associating words with rhythm, the participants will clap to the syllable. The activity provides the opportunity to work on hand-eye coordination while paying attention to the instructor.

Structure of the activity: The activity will consist of two parts. For the first part, the instructor or the therapist will clap a simple rhythm associated with a word. Each clap represents a syllable. For example, clapping three times for the word “banana.” Then the participants will repeat three times with the instructor. Next, the instructor or therapist may choose a participant to create their own rhythm. Encourage the participants to be creative with the words and rhythm.

Goals supported by the activity:

1. Engaging in shared attention (signaling verbal and physical cue to clap)
2. Promoting turn-taking (taking turns with the instructor)
3. Facilitating hand-eye coordination (clapping while watching the instructor)



Figure 5: Individual clapping each syllable of "Banana"

Activity 6:

Name: Drum with me

Group size: 3+

Summary: The activity will provide an opportunity for participants to use drums to represent their feelings and communicate with another one. The participants may use verbal or nonverbal cues to invite the other person to drum together and take turns.

Structure of the activity: To prepare for the activity, the instructor and therapist will prepare a list of songs with different emotions, such as songs with happy lyrics and upbeat tempos. Then the participants will be given small drums or percussive instruments to play. To begin the activity, the participants will play alone for the first song. Next, they will be assigned a partner to drum together. The process allows the participants to communicate and share their music-making as a group.

Goals supported by the activity:

1. Initiating and engaging shared attention (paying attention to music and partner)
2. Promoting turn-taking (taking turns with partner)
3. Maintaining eye contact (providing signal when to take turns or play together)



Figure 6: Individual playing on a drum

Activity 7:

Name: I am Everyone!

Group size: 8+

Summary: The activity provides the opportunity to take turns announcing their characters. While initiating eye contact, the participant guides everyone else to create and mimic the character's movement.

Structure of the activity: First, split the participants into groups of 4-5. Next, ask the participants to form a circle. To demonstrate, the therapist or instructor will begin by saying out loud who they want to be. For example, they could say, "I am Spiderman". Then the entire group will pretend to be Spiderman. Encourage the participants to use their bodies to mimic the person they want to be. After each person has their turn, a new group may form to continue the activity.

Goals supported by the activity:

1. Promoting turn-taking (sharing turns on their characters)
2. Initiating eye contact (looking at group to announce their characters)
3. Practicing motor movements (exploring body movements through different characters)
4. Promoting imitation (mimicking group body movements)



Figure 7: A group of individuals acting as Spiderman

Activity 8:

Name: Follow the Palm

Group size: 2+

Summary: The participants will take turns in following and leading the palm. It provides the opportunity to initiate and engage in shared attention while coordinating movements between the leader and follower.

Structure of the activity: All participants will be assigned a random partner at the beginning of the activity. Then the partners will determine who will be the leader and follower. Using their palm, the leader will face their palm to their partner and move them slowly around the room. The follower will move and adjust their head to be close to the palm. Next, the leader and follower will switch roles. The activity works best with slow, relaxing music to facilitate slow movements.

Goals supported by the activity:

1. Initiating and engaging in shared attention (sharing attention to the palm)
2. Promoting turn-taking (taking turns in following the leader)
3. Facilitating hand-eye coordination (moving while following the palm)



Figure 8: An individual looking at the palm of their partner

Activity 9:

Name: Mirroring

Group size: 2+

Summary: The activity provides the opportunity to use nonverbal language to initiate and engage in their partner's movements. The process involves the partner engaging in turn-taking behaviors.

Structure of the activity: All participants will be assigned a random partner at the beginning of the activity. Using only the upper body, the participants will mirror and copy their partner's movement. As there are no roles assigned, the partners will learn to take turns and adapt to their partner's motion. They may not use verbal communication to change their roles. The participants may also sit or stand while doing the activity with their partners. The activity works best with slow, relaxing music to facilitate slow movements.

Goals supported by the activity:

1. Initiating and engaging in shared attention (sharing movements with a partner)
2. Promoting turn-taking (taking turns leading and following the motions)
3. Facilitating hand-eye coordination (coordinating movements while looking at partner)
4. Promoting imitation (mimicking and copying partner's motions)



Figure 9: Two individuals mirroring each other

Activity 10:

Name: Tossing the Energy Ball

Group size: 4+

Summary: The activity provides an opportunity for participants to work as a team and toss an invisible ball around the group. It requires the group to take turns in sharing and using eye contact and joint attention to pass the ball.

Structure of the activity: All participants will gather around to form a circle. Next, one player will volunteer to pretend to hold a small energy ball in their hands. While holding the energy ball, the person will call for another person to hold it. When throwing the energy ball to the other player, the energy ball will grow bigger! However, a player may shrink the energy ball at any time. After everyone had a few turns to hold the ball, the ball will shrink and become small again for another round.

Goals supported by the activity:

1. Initiating and engaging in joint attention (focusing on the invisible energy ball)
2. Initiating and maintaining eye contact (using eye contact to communicate)
3. Promoting turn-taking (passing the ball around to everyone)
4. Practicing motor movements (shrinking, expanding, tossing the invisible energy ball)

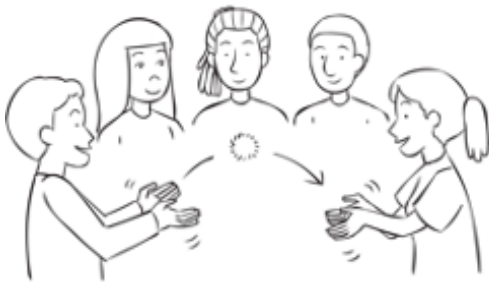


Figure 10: A group of participants tossing an invisible energy ball

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ACADEMIC VITA

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EDUCATION

The Pennsylvania State University | Schreyer Honors College | May 2022 University Park, PA
B.S. Communication Sciences and Disorders | B.M.A Violin Performance
Honors Thesis: *Resources for Individuals with Autism Spectrum Disorder Using Improvisational Music and Dance Movement Therapy Techniques*

LEADERSHIP & ACTIVITIES

Music Service Club

Co-President Fall 2021 – Present

- Curated meeting slides for weekly general body and board meetings
- Amended club constitution, applied for grants, awards, scholarships, and office space
- Delegated weekly tasks to executive officers and served as point of contact for faculty club advisor

Service Vice President Spring 2020

- Organized music therapy events to elementary schools, special-needs facilities, and medical centers
- Secured new partnerships with external community facilities to schedule events and performances
- Designed and edited video performances to distribute to community partners during Covid-19

THON Stage Performer 2020 – 2021

- Performed onstage as a violinist at Bryce Jordan Center for families impacted by childhood cancer

NSSLHA- For Good Troupe Fall 2020 – 2021

- Served as violinist for final performance in collaboration with the Centre Region Down Syndrome Society
- Volunteered as a peer for individuals with Down Syndrome in Central County
- Participated in sign language, dance, and improvisation activities

Music Ensembles

- Performed as a violinist in the Penn State Philharmonic Orchestra, Chamber Orchestra, and String Quartet.

WORK EXPERIENCES

Acoustic Principles Teaching Assistant Fall 2021

- Arranged weekly office hours and assisted professor with quizzes and assignments grading
- Coordinated study sessions with students

Pollock Hall Resident Assistant Fall 2021 – Present

- Facilitated a safe, inclusive, and fun community among 36 first-year students
- Served as Hall Diversity Chair, providing official statements regarding upcoming cultural events and diversity resources
- Created lectures on accessing campus resources and spoke in information sessions on professional development
- Organized weekly social and academic floor events to facilitate a close-knit environment
- Collaborated with a team of 12 resident assistants to discuss social events, safety concerns, and other incidents that occurred throughout the week

HONORS & AWARDS

Communication Disorders Award (2021), Harold & Nancy O'Connor Music Scholarship (2021), President's Award (2018), University Park Provost Award (2018 – 2022), Music Activities Fund Recipient (2018 – 2021), Dean's List (2018 – 2020)

SKILLS

- Fluent in spoken and written Cantonese
- Professional proficiency in spoken Mandarin
- Music editing (Ableton), photo and video editing (photoshop, iMovie)