5-2024

The Experience of an Autistic and Neurotypical Sibling Dyad in Improvisational Music Therapy

Gianna DeRusso

THE EXPERIENCE OF AN AUTISTIC AND NEUROTYPICAL SIBLING DYAD IN IMPROVISATIONAL MUSIC THERAPY

A Thesis Submitted to Molloy University
Music Department, Rockville Centre, NY

In Partial Fulfillment
of the Requirements for the Degree

Master of Science
in
Music Therapy

---

by

Gianna DeRusso, MT-BC

May 2024

Molloy University

A thesis committee has examined the thesis titled:

THE EXPERIENCE OF AN AUTISTIC AND NEUROTYPICAL SIBLING DYAD IN IMPROVISATIONAL MUSIC THERAPY

Presented by Gianna DeRusso, MT-BC

A candidate for the degree of Master of Science in Music Therapy

And hereby certify that the thesis was read and approved by the committee

Maria C. (Nina) Guerrero, PhD, MT-BC
Thesis Advisor

May 13, 2024

Elizabeth K. Schwartz MA LCAT MT-BC
Committee Member

May 7, 2024

Dr. Suzanne Sorel
Director of Graduate Music Therapy

Date

ABSTRACT

The purpose of this study was to explore the sibling relationship within improvisational music therapy, specifically the relationship between an autistic sibling and a neurotypical sibling. The following research question was posed: How does the relationship between a neurotypical and autistic sibling dyad present in improvisational music therapy? Subquestions to the research questions included: How do a neurotypical and autistic sibling dyad interact with one another within an improvisational music therapy session?, and How do a neurotypical and autistic sibling dyad interact with the music therapist within an improvisational music therapy session? An autistic and neurotypical sibling dyad was recruited, and data were collected through a microanalysis and thematic analysis of an archived video of a session with the sibling dyad. The following themes emerged from the data: Theme #1: Fields of Trust, with subthemes Existing and Continually Developing Relationships and Newly Established Relationships; Theme #2: Communication Beyond Words, with subthemes Communication Through Physical and Gestural Cueing, Communication Through Eye Gaze, and Attunement and Mirroring Through Musical Communication; and Theme #3: Independence Within Interdependence. Results showed that the peer relationship facilitated and naturally present between siblings and the previously established trust and roles within the relationship influence the music experiences that unfold in the session. The in-depth analysis of the sibling interaction within the improvisational music therapy setting provided insight into how siblings interact with and respond to the music therapist and vice versa.

Keywords: Music therapy, improvisation, autism, neurotypical, siblings.

ACKNOWLEDGEMENTS

To my advisor, Nina, thank you for always being a text and email away, guiding me with such patience and wisdom, and consistently reminding me to care for myself throughout this process. To my committee member Beth, I was thrilled to find out you would be a part of this process with me; to know you and learn from you over the years has been an honor. To the Molloy staff and my cohort, thank you for sharing your experiences; I am so thankful to have chosen this program and for this program to have chosen me in the way that it did. To my fieldwork advisors, Lee and Jon, thank you for all the opportunities, exposure, and immersion in the field. To the amazing staff I had the privilege of learning from in my internship, and am now getting to collaborate with and continue to learn from as an employee, I am so appreciative. And to all the wonderful clients and their families I have met throughout my training and will continue to meet throughout my career, thank you for allowing me into your lives and connecting with me in your own ways through music.

To my mother, who has been my rock my entire life and is my best friend, thank you for everything; I could never truly thank you enough. To my father, who has taught me to work hard no matter what life throws my way, thank you for believing in me. To my brother, Christian, who is the reason I am in this field, thank you; I am so proud of you. To my little Luca, who came into my life the day before I started this journey and curled up by my side through it all. To my Papa, for instilling and nourishing my love for music at such a young age, and for being a living example of what it means to cherish family and life. To my Nani, for showing me true strength. And to some of the wonderful people I get to call my friends and to my Luciano, thank you for your love, your laughter, and for filling my life with the most unforgettable experiences and memories.

Table of Contents

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

This study explores the sibling relationship within improvisational music therapy, specifically the relationship between an autistic sibling and a neurotypical sibling, and their experiences during an improvisational music therapy session together. The researcher recruited one sibling dyad and analyzed an archived video recording of an in-person session with the siblings.

Personal Background and Connection to the Research

I was drawn to music at a very young age. My first memories of exposure to instruments were in my grandfather's piano room, which simply housed an upright electric piano, a guitar, and a bench to sit on. I remember summers at my grandparents' house when I would run back and forth from the kitchen to the piano room while my parents worked, cooking with my grandmother and singing with my grandfather. I learned to play the piano by ear because that is how my grandfather learned, himself. I learned to sing by feeling the words and their emotions because he embodied that wholeheartedly. Music was all about feelings, expression, and fun. When I was 8, I began my journey as a violinist, and music became a part of who I was. My attention was occasionally diverted by sports or other school activities, but my priorities always pulled me back to the music. I just loved it.

In high school, when it was time to pick a career path, I knew I wanted music in my life, and I knew I wanted to help people. I was drawn to teaching but felt that so many students in music education courses were there to fill a credit or because their parents told them they had to be. I couldn't see myself spending so much of my time convincing students to practice and instilling a love that just wasn't there. It was in my junior year of high school that I learned about

music therapy from a friend, and everything seemed to align. The idea of people joining me in music because they wanted to and loved it like I did *and* being a part of their process to achieve their goals was everything I could hope to pour my life into.

I am interested in researching the experiences of neurotypical and autistic sibling pairs in music therapy sessions, because I have lived this dyad my entire life. Right after I was born, my brother was diagnosed with autism at the age of 3. In my early years of development, I did not understand my brother's disability, as it was not something that I noticed. When my brother and I were in elementary school together, I started to notice his social differences, and noticed people teasing and making jokes about him. As the younger sibling, I felt myself taking on the older sibling role to protect and defend my brother, while occasionally being the eyes and ears for my parents in social settings. Growing older, I noticed differences between my relationship with my brother and the relationships of other siblings in high school, observing how they would visit each other at their lockers during the day, or tease each other and their friends in passing in the hallway. In our home life, milestones such as driving held a heavier weight for me because my brother, as the older sibling, chronologically "should" be doing those things first.

In noticing these differences, I was also noticing the ways that my brother and I were the same. We both loved music, enjoying a variety of opportunities such as choir, show choir, and theater. Audience members praised his confidence and creativity, teachers raved about his vocal projection and pitch, and I noticed a comfortability that I did not see in him anywhere else. On stage, he was unapologetically himself. He was never nervous, never forgot his part, and never passed up an opportunity to take on more roles and responsibilities. We started theater programs together when I was 5 years old, so I was able to see the progression of his talent and his individuality as time went on, something that so many others in his life were not as attuned to as

I was. When we were in shows together, we were connecting in a way that we did not connect in any other setting in our lives. We were talking about plots of the shows we were in, meeting each other's friends, telling stories of the different experiences we were having with our teachers, figuring out what our dinner order would be during each night of tech week, and even learning, singing, and practicing lines at home on the occasion that our busy schedules allowed. Music was building our individuality while also creating a special foundation in our relationship.

My lived experience led me to be interested in understanding the relationship between autistic and neurotypical siblings in music therapy through the perspective of the siblings themselves, and through my personal lens of experience with this kind of sibling dyad. I am specifically interested in improvisational music therapy with a relationship-based format because daily interactions between people outside of music therapy are generally improvised and spontaneous. At the same time, in my personal understanding, spontaneity and reciprocity may be areas of particular challenge for autistic people. Improvisational music therapy as the basis of the interventions highlights and further explores this social and interactive component that is present both in the session and in the individuals' lives outside of the session.

An extensive review of past research shows that there is robust literature regarding improvisational music therapy with autistic clients in individual and group settings, though limited information regarding settings that include siblings. My study will build upon this past research by exploring and highlighting the dynamics of the interaction between a neurotypical and autistic sibling dyad within improvisational music therapy. Such research would benefit the field of music therapy because there is a potential to spotlight the individuals in their lived experience rather than from the perspective of their parents, caregivers, or others. Thus, this research could advocate for the importance of understanding the perspectives of individuals

experiencing therapy first-hand. Additionally, such research could encourage music therapists to intentionally create sibling dyads in therapy and affirm the importance of exploring and supporting the sibling relationship through improvisation.

The following research question will be explored: How does the relationship between a neurotypical and autistic sibling dyad present in improvisational music therapy? Subquestions to this research question include: How do a neurotypical and autistic sibling dyad interact with one another within an improvisational music therapy session?, and How do a neurotypical and autistic sibling dyad interact with the music therapist within an improvisational music therapy session?

This researcher utilized the phenomenological approach to explore the unique experiences of a specific sibling dyad in music therapy. I hold a strong belief that human beings' experiences of nurture in their early development and throughout their lives shape who they are at their core and in their unconscious, and in turn, how they present outwardly in the world. Thus, I worked within the classification of interpretivism to focus the research on understanding the meaning of participants' experiences. I viewed an archived video recording of an in-person music therapy session with the sibling dyad, which took place prior to the inception of this research. I am the music therapist in the session as well as the researcher and used a session that occurred prior to the inception of the study served to eliminate any influence of the research upon the session. This included influence upon myself as the music therapist working with the siblings, as well as influence upon the siblings due to awareness of being studied. The video was analyzed through a microanalysis to understand the music and how it developed within the session, particularly in relation to the siblings' interaction and communication.

To provide context for this research, the following terms will be defined: music therapy, improvisational music therapy, Nordoff-Robbins Music Therapy, Autism Spectrum Disorder, and neurotypical.

Music Therapy

The American Music Therapy Association defines music therapy as

> the clinical & evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program. (American Music Therapy Association, 2024)

World-renowned music therapist and author Kenneth Bruscia (2014) organizes the possibilities of music therapy practice into four methods: re-creative, receptive, compositional, and improvisational. He offers the following definition of music therapy:

> Music therapy is a reflexive process wherein the therapist helps the client to optimize the client's health, using various facets of music experience and the relationship formed through them as the impetus for change. As defined here, music therapy is the professional practice component of the discipline, which informs and is improved by theory and research. (p. 36)

Though music therapists vary in their choice of methods based on their framework and scope of practice, each method provides opportunities to connect with clients and work toward their individual and unique goals. In this study, improvisational music therapy methods are explored and discussed most frequently.

Improvisational Music Therapy

Improvisational music therapy is used to address a variety of therapeutic goals, including but not limited to increasing flexibility and expanding expressive communication skills (Carpente & LaGasse, 2015). According to Bruscia (2014), in improvisational music therapy,

> the client makes up music while playing or singing, extemporaneously creating a melody, rhythm, song, or instrumental piece. The client may improvise alone, in a duet, or in a group that includes the therapist, other clients, and sometimes significant others. The client may use any musical medium within her capabilities (e.g., voice, body sounds, percussion, stringed or wind instruments, keyboard, and so forth). (p. 130)

Nordoff-Robbins Music Therapy

A specific improvisational music therapy approach based on music-centered practice is known as Nordoff-Robbins Music Therapy, which emphasizes the relationship between therapist and client(s) and the cultivation of spontaneity (Guerrero et al., 2015). Nordoff-Robbins Music Therapy (NRMT), which is also known as Creative Music Therapy, was developed by Paul Nordoff and Clive Robbins in 1959. It is defined by Gardstrom and Sorel (2015) as an approach that

> involves the improvisational use of music to evoke responses; develop relationships; and address emotional, cognitive, social, and musical goal areas…The training is humanistic and music-centered…the music acts as the primary agent of change, as opposed to functioning as a means to an end or solely as a vehicle for reaching nonmusical goals. (pp. 123-124)

The focus on Nordoff-Robbins Music Therapy as the main approach used with the clients in this study highlights the constant adjustments, alterations, and information to which human beings are required to respond in daily interactions with those around us. Additionally, the significance of relationships in this approach provides the clients in this study with opportunities to practice and build upon a foundation that has developed in the existing relationship with their sibling.

Autism Spectrum Disorder

As defined by the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013), Autism Spectrum Disorder (ASD) meets three criteria:

> A. Deficits in intellectual functions, such as reasoning, problem solving, planning, abstract thinking, judgment, academic learning, and learning from experience, confirmed by both clinical assessment and individualized standardized intelligence testing
>
> B. Deficits in adaptive functioning that result in failure to meet developmental and sociocultural standards for personal independence and social responsibility. Without ongoing support the adaptive deficits limit functioning in one or more activities of daily life, such as communication, social participation and independent living, across multiple environments, such as home, school, work, and community.
>
> C. Onset of intellectual and adaptive deficits during the developmental period (p. 33)

Across these criteria, ASD is specific to each person in their experiences and how their diagnosis presents itself in them, as will be expanded upon in the literature review below.

Neurotypical

The Merriam-Webster dictionary defines *neurotypical* as "exhibiting or characteristic of typical neurological development" (Merriam-Webster). Lisa Jo Rudy (2023), a writer and autism advocate, expands the definition of *neurotypical* to generally describe someone who thinks and behaves in a way that is considered "the norm" by the general population. She states that neurotypical does not mean normal, but rather reflects behavioral norms that differ from culture to culture (Rudy, 2023). Examples of neurotypical characteristics include communicating in a give-and-take manner and with appropriate volume and speed in a given situation, ability to express empathy, understanding of nonverbal communication such as facial expressions and body language, understanding the different meanings of literal and abstract concepts, and navigating multiple stimuli at one time (Rudy, 2023). In the present study, there are occasions where *neurotypical* and *typically developing* are used interchangeably.

Chapter 2 will review literature pertaining to music therapy and autism as well as family therapy to explore the following question: How does the relationship between a neurotypical and autistic sibling dyad present in improvisational music therapy? Subquestions include: How do a neurotypical and autistic sibling dyad interact with one another within an improvisational music therapy session?, and How do a neurotypical and autistic sibling dyad interact with the music therapist within an improvisational music therapy session?

CHAPTER 2: LITERATURE REVIEW

This literature review provides an in-depth exploration of ASD in daily life, autistic and neurotypical interaction and relationship, autistic and neurotypical sibling interaction and relationship, music and autism spectrum disorder, autistic and neurotypical interaction and relationship in music, siblings in family therapy, and family-centered music therapy. There is robust literature regarding music therapy with autistic people; however, there is limited research that includes siblings in music therapy, especially a dyad consisting of one autistic sibling and one neurotypical sibling.

Autism Spectrum Disorder in Daily Living

Autism Spectrum Disorder may have a wide-ranging impact upon an individual's daily interactions with the world around them. Autistic individuals have differences in brain function when compared with non-autistic individuals, and these differences will outwardly present in a variety of ways, including an individual's behavior, communication, interaction, and learning, all differing from person to person (The Centers for Disease Control and Prevention, 2022), with the potential of evolving over time (World Health Organization, 2023). Diagnostic criteria for autism as outlined by the *Diagnostic and Statistical Manual of Mental Disorders - Fifth Edition* (American Psychiatric Association, 2013) include difficulties in social communication and interaction in areas of social-emotional reciprocity; restricted or repetitive patterns in motor movements, speech, and routine; and/or hyper- or hypo-reactivity to sensory aspects of a given environment. Yo Dunn, a specialist in autism and law, creates and delivers training for social workers to support autistic people, and speaks about aspects of the autistic experience in her book *Social Work with Autistic People: Essential Knowledge, Skills and the Law for Working*

with Children and Adults (2020). Dunn (2020) draws from the medical and social models of autism to explain that modern understanding of autism more readily recognizes how autistic people view the world differently from non-autistic people, noting that "the view is not automatically or necessarily wrong or deficient, but distinctly different" (p. 19).

Autistic and Neurotypical Interaction and Relationship

All individuals interact and develop relationships with others in a variety of settings, with some of the first interactions being in school-based programs at a young age. A pilot trial conducted by Cook and his colleagues (2019) investigated the impact of music programs in schools on prosocial attitudes, behaviors, and emotions in autistic and neurotypical children. Participants were 10- to 11-year-old children enrolled in an 11-week 35-minute singing class designed to develop social skills and music interaction and engagement with one another (Cook et al., 2019). Results showed that the neurotypical children enrolled in the inclusion music program developed a significant increase in prosocial emotions in comparison to the neurotypical children enrolled in a music class that did not include autistic children. Further, there was a decrease in victimization for autistic students, showing that positive contact with peers in social settings and situations has the potential to minimize the tendency of the autistic individual to be victimized and increase the likelihood of positive social development among neurotypical and autistic students.

Another setting for interaction and relationship development is casual, recreational settings. A qualitative study conducted by Crompton et al. (2020) explored the experience of autistic adults aged 21 to 51 socially interacting and spending time with neurotypical and autistic family and friends. Participants answered semi-structured interview questions around their social interactions, including the positive and negative feelings during and after spending their time

with neurotypical family and friends and autistic family and friends. Participants described that they felt better understood and more comfortable spending time with autistic people in comparison to neurotypical people, and felt that they belonged and could be themselves with autistic people, while they more often than not had to conform to neurotypical people's wants and needs in order to interact and spend time with them.

Another study of relationships between autistic and neurotypical people was conducted by Mössler et al. (2023), exploring the relational phenomenon of attunement with a focus on specific aspects of interaction. Participants included a music therapist and two focus groups consisting of parents of autistic children and colleagues from a variety of professions. The music therapist answered semi-structured interview questions regarding a video vignette of one of her sessions with an autistic child showing a self-identified failed attunement. The focus groups provided insight based upon their perceptions of attunement in the video vignette. Results of this interpretive-hermeneutic approach showed that attunement dynamics are impacted by four spaces: the physical, professional, sensory, and relational spaces. The child's sound creation in the video vignette was identified as reflecting the child's way of knowing, and it was the study participants' consensus that this should be listened to carefully and not questioned or disregarded.

Autistic and Neurotypical Sibling Interaction and Relationship

In regard to the sibling relationship between autistic and neurotypical individuals, researchers have found that there is an influence of the autistic sibling upon their neurotypical sibling. Smith et al. (2015) conducted a quantitative study examining the impact of a sibling with ASD upon typically developing (TD) adolescents between 11 and 18 years of age, specifically upon the TD adolescent's stress, resources, and sense of coherence. Participants answered a

mail-based survey, completing the Adolescent Coping Orientation for Problem Experience, Network of Relationship Inventory-Social Provision Version, Youth Self Report, and Sense of Coherence instruments. Results of a descriptive analysis showed that greater ASD severity in the autistic sibling causes more problem behaviors in TD adolescent siblings, the stress of ASD severity and resource of adjustment are related in the TD sibling, TD adjustment has a strong relationship with coherence levels, and more positive coping mechanisms in the TD sibling buffer coherence when the sibling with ASD has a higher severity score.

A longitudinal study conducted by Orsmond and Seltzer (2009) aimed to explore how a sibling relationship, wellbeing, and participation in shared activities differ during adolescence and adulthood when one sibling has a diagnosis of ASD, specifically with respect to age, gender, and characteristics of the siblings, family, and resources. Participants from 406 families with adolescent or adult siblings with one sibling diagnosed with ASD participated in either a mailed questionnaire or a 45-minute phone interview followed by a brief mailed questionnaire, completing the Positive Affect Index, The Center for Epidemiologic Studies Depression Scale, COPE, the Perceived Social Support Scales, and the Scales of Independent Behavior-Revised. Results showed that autistic siblings' behaviors impact the sibling relationship, making neurotypical siblings "less willing to engage in activities with their brother or sister with ASD, especially activities in public context," and parents "less willing to engage in family activities such as going out for a meal…therefore limiting the opportunity for siblings to engage in shared activities" (Orsmond & Seltzer, 2009, p. 76). Results from the adult participants showed that female adults with sisters with ASD experienced a more positive impact of their sibling upon the relationship, while a male adult with a sister with ASD experienced the least impact.

Further exploring the autistic and neurotypical sibling experience from the perspective of the siblings themselves, the book *Voices from the Spectrum: Parents, Grandparents, Siblings, People with Autism, and Professionals Share Their Wisdom* (Ariel & Naseef, 2005) contains a chapter titled "My Brother... Ahhhhhhhhh" by Zoë Naseef, written from the perspective of a neurotypical sibling growing up with an autistic brother. The chapter provides a unique perspective on the impact of autism on families and siblings, highlighting the challenges and joys of growing up with a brother with autism. Naseef shares her personal experiences of navigating the world with her brother, detailing how she has had to adapt and advocate for him in various settings. She also discusses the complex emotions that can arise when living with a sibling diagnosed with autism, including feelings of frustration, guilt, and love. Overall, "My Brother... Ahhhhhhhhh" is an insightful account of a neurotypical child's perspective on her unique relationship with her autistic sibling.

Music and Autism Spectrum Disorder

Studies have shown that autistic individuals may have specific and unique sensitivities to aspects of music. A study conducted by Heaton (2003) explored pitch memory, the ability to accurately perceive and remember pitch information, and the impact of labeling and disembedding tasks on pitch perception in individuals diagnosed with ASD. The 14 participants, aged 7 to 15 years, participated in two experiments, and 13 of those children along with two additional children participated in a third experiment. The children diagnosed with ASD attended a school based on a diagnosis of ASD that met the standard clinical criteria, and all engaged in the Raven's Matrices and Peabody Picture Vocabulary Test before the experiments (Heaton, 2003), Raven's Matrices being a non-verbal general human intelligence test and Peabody Picture Vocabulary a receptive vocabulary test. There were two control groups of neurotypical children

who matched the ASD group with respect to age, gender, and performance on either the Raven's Matrices and Peabody Picture Vocabulary Test, as well as attended a mainstream school or a school that supported students with moderate learning disabilities (Heaton, 2003). Results showed that there is a qualitative difference in the representation and processing of pitch information between autistic and neurotypical individuals. Specifically, in Experiment 1, "children with Autism showed significantly better retrieval of individual labelled tones than controls"; Experiment 2 showed "better disembedding of these pre-exposed tones from musical chords"; and Experiment 3 showed that when "tones were not pre-exposed and retrieval labels were not provided, no group difference emerged," and both groups yielded to the perception of the whole and complete structure of the music (Heaton, 2003, pp. 547-548).

Xu and colleagues (2022) studied neural responses in individuals with ASD to musical and facial expressions connected with emotional states, given that auditory and facial expressions are significant aspects of social communication. Twenty autistic individuals aged 21 and twenty-one neurotypical individuals aged 21 participated in the first experiment involving happy/pleasant faces and angry/unpleasant faces, and the second experiment pertaining to pleasant and unpleasant chords in a progression (Xu, 2022). Regularities were explored in local processing of specific details of a stimulus; and global processing, integrating details across a whole (Xu, 2022). Local processing involved a short timescale and took place within a trial, while global processing involved a long timescale and took place across trials (Xu, 2022). Results of the study suggest that the autistic brain perceives and responds to emotional regularity in a nuanced way, and that local regularities are more easily recognizable than global regularities across a sequence.

Similarly, Caria and colleagues (2011) aimed to understand the neural processes of autistic individuals as compared with neurotypical individuals in the emotional processing of music. Twenty-two participants, including eight individuals with ASD and 14 neurotypical individuals, listened to music classified by the investigators as happy or sad, including 10 happy music excerpts, 10 sad music excerpts, and 10 control stimuli; control stimuli included random tone sequences, no rhythmic structure, and no melodic contour (Caria et al., 2011). Results showed altered patterns of brain activation on fMRI scans in participants with ASD as compared with neurotypical participants, with both happy and sad music appearing to provide a strong, emotional, and rewarding stimulus for participants with ASD. The study thus provided neurological justification for music therapy for individuals with ASD to work toward emotional skills and communication (Caria et al., 2011).

In his 2020 dissertation, autistic music therapist Dr. Jon Fessenden explored how autistic people experience and perform music, known as autistic musicality. In his work, Fessenden (2020) locates himself as an autistic person who found sight-reading music quite difficult, though he performed well in experiences involving dictation of music. Fessenden (2020) contextualizes his own understanding of the simplicity of some tasks and the complexity of others both within and outside of music experiences, and generalizes this to the understanding of autistic musicality and how other autistic people connect with the world around them.

In a case study of his client Galen, Fessenden (2020) highlights musicking as a form of communication, illustrated by Galen's engagement in back-and-forth exchange in their musical interactions. Fessenden (2020) also expresses curiosity about how Galen would relate to others with similar musical skills and understanding of form, highlighting the importance of autistic people's connection to music and how that connection can support their interactions and

relationships with others as well. In a case study with his client Ronny, Fessenden (2020) highlights Ronny's strong pitch perception and, by contrast, his rhythmic inconsistencies. Ronny was responsive to spontaneous imitation and call-and-response interactions in their work over time, and this allowed for an "interactive improvisational dialogue" (Fessenden, 2020, p. 219). In the context of this study, Fessenden's work emphasizes the importance of music in coming to understand and relate to autistic people and the overall "human musical experience" (Fessenden, 2020, p. 250).

Music Therapy and Autism Spectrum Disorder

Carpente and LaGasse's (2015) chapter "Music Therapy for Children with Autism Spectrum Disorder," in Wheeler's *Music Therapy Handbook*, provides an overview of the benefits of music therapy for children with ASD. The chapter discusses the ways that music therapy can address unique challenges that children with ASD may face in areas such as communication, social interaction, and sensory processing. Carpente and LaGasse (2015) present a range of music therapy techniques and interventions, including improvisation, songwriting, and use of technology, and discuss their effectiveness in promoting social communication, emotional regulation, and overall well-being. They also highlight the importance of collaboration among music therapists, families, and other healthcare professionals in providing overall care for children with ASD.

Geretsegger et al. (2015) aimed to establish treatment guidelines for significant aspects of improvisational music therapy with children diagnosed with ASD. The investigators identified features, principles, and techniques of improvisational music therapy in existing literature and, from these, developed a draft of treatment guidelines (Geretsegger et al., 2015). Participants in the study were music therapy clinicians from 10 different countries who completed a survey, and

music therapy clinicians from three different countries who took part in a focus group to evaluate guideline items and create new and improved guidelines. Results showed that many of the initial items were verified, with new proposed items including musical and emotional attunement, flow of interaction, and shared history of musical interactions between client and therapist. Overall, the findings demonstrated a general consensus regarding the core principles of improvisation in music therapy with children diagnosed with ASD.

Guerrero and Turry (2012) focus on the use of Nordoff-Robbins music therapy in supporting the development and well-being of young children with ASD. The chapter provides an overview of the Nordoff-Robbins approach, which emphasizes music improvisation as a means of supporting self-expression, communication, and social interaction in children with ASD. The authors discuss aspects of Nordoff-Robbins music therapy, principles of clinical improvisation with young children diagnosed with ASD, and the importance of client-centered interventions that are tailored to meet the specific needs and strengths of each individual. Throughout the chapter, the authors highlight the benefits of Nordoff-Robbins music therapy in supporting the emotional, social, and cognitive development of children with ASD and offer insights into the challenges and opportunities of working with this population.

With all that occurs in music therapy, the hope is that skills and ideas are generalized to the individual's life outside of therapy. Funahashi (2022) conducted a thematic analysis to gain a fuller understanding of an autistic adolescent's experience in music therapy and explore the roles of music therapy in the larger context of the adolescent's life. The participants of this study were an adolescent student receiving music therapy services in a school setting, a parent of the student, and a professional who was a long-term member of the adolescent's treatment team (Funahashi, 2022). Results showed that improvisational music therapy contributed to developing

the adolescent's nonverbal communication, while addressing his individual differences in sensory processing; allowed him to experience a variety of emotions with other people; cultivated interpersonal engagement and intrinsic motivation to be in music; supported coping with difficult feelings, while providing a space to "just be"; promoted expression of emotions and his "own voice"; and provided an outlet to share his inner life (Funahashi, 2022).

A variety of music therapy approaches can be incorporated to address the goals of autistic individuals. Neurologic music therapy (NMT) was used in a pilot study by Cibrian et al. (2020) which assessed the effectiveness of a technological intervention of elastic touch-display to improve coordination, timing, and strength in the control of movements in children diagnosed with autism. The elastic touch-displays used in this study were surfaces with varying levels of flexibility that allowed the user to experiment with a variety of movements and levels of force to manipulate and create sound (Cibrian et al., 2020). Participants were 22 children with ASD who participated in eight NMT sessions. They were randomly assigned to either elastic touch-display or tambourines, and completed pre- and post-intervention assessments using the Developmental Coordination Disorder Questionnaire and motor assessments. Results showed that all of the participants had improved coordination across conditions, with participants scoring higher when using the elastic touch-display.

Among the various music therapy opportunities for children with ASD, the Developmental, Individual-Difference, Relationship-Based (DIR)/Floortime framework within a music therapy context is important to highlight. Developed by Stanley Greenspan, the DIR model "examines the functional developmental capacities of children in the context of their unique biologically based processing profile and their family relationships and interactive patterns" (Wieder & Greenspan, 2003, p. 426). The *D* represents developmental capacities such

as shared attention and problem solving, the *I* represents individual differences in processing and regulation, and the *R* represents the relationship necessary for interaction to be practiced (Wieder & Greenspan, 2003, pp. 426-427). Dr. John Carpente has taken this framework and applied it to client-led clinical and research-based music therapy approaches. Carpente (2017) worked in this framework with four autistic children between the ages of 4 and 8 years, all enrolled in a 13-week span of 24 individual 30-minute sessions. Phases of the intervention included following the child's musical-emotional lead, two-way purposeful musical play, and affect synchrony in musical play. Results of the study demonstrated the children's "improvements in self-regulation, engagement, behavioral organization, and two-way purposeful communication" (Carpente, 2017, p. 160).

Autistic and Neurotypical Interactions and Relationship in Music

Eilat and Raichel (2016) examined the experiences of autistic and neurotypical children in a children's choir in Israel. Participants of the study included 16 individuals: two fifth-grade girls from Tmarim School, three mothers of children attending Tmarim School, one mother of a child attending Zamir School, two teachers from each school, two teaching assistants at Zamir School, one inclusion coordinator from each school, and the principal of each school. Data were collected through semi-structured interviews of the children and adults. Overall, results showed that participation in the children's choir played several important roles in the experience of both autistic and neurotypical children: a musical role of vocal production and practicing harmony; a social role in providing a learning environment for interaction; an educational role, in that singing enabled the practice and acquisition of knowledge in language and mathematics through rhythms and counting; a cultural role in providing opportunity for the children to engage in their Israeli heritage; and an emotional role in improving self-image through enhancing the

individual's abilities. Specifically for autistic participants, a homeroom teacher and parent noted that lyrics aided in vocabulary expansion and rhyme schemes aided in word retention (Eilat & Raichel, 2016). It was also noted that some of the autistic participants were practicing the choir music with no intention of performing, showing that there was an intrinsic motivation to be in music and with others because of the enjoyment of the music and experience, rather than for an end product or praise from adults or an audience (Eilat & Raichel, 2016).

Siblings in Family Therapy

Because siblings are typically close in age, sibling interaction is more closely related to peer interaction than a parent-child interaction. Because siblings typically live together within the same family system, their relationship is unique among other peer relationships. A study conducted by Wright and Benigno (2019) explored implications of sibling involvement in the speech-language pathology treatment of children with ASD. Wright and Benigno (2019) explain how parents, siblings, and peers interact with the autistic child on a daily basis, and that there is rich research on parent and peer involvement in treatment but scarce research on sibling involvement. Family systems theory (FST) holds that the sibling relationship is affected by and has effects on the family system as a whole (Wright & Benigno, 2019, p. 760). Because the sibling relationship exists across multiple settings, a sibling involved in treatment can provide a unique perspective on socially relevant contexts and play a crucial role in the treatment process (Wright & Benigno, 2019, p. 760).

A study highlighting sibling therapy was conducted by Spector and Charlop (2017) exploring the implementation of Natural Language Paradigm (NLP) with typically developing siblings and autistic siblings. NLP includes procedures such as turn-taking that are significant in language acquisition. It is "tailored to the current level of speech production of the individual

with ASD, and is continually modified" (Spector & Charlop, 2017, p. 1509). Participants in this study included three sibling dyads between the ages of 7 and 11 years at an after-school behavioral management center in which the autistic children were already enrolled (Spector & Charlop, 2017). Typically developing siblings received NLP training via video modeling, and were then reintroduced to their autistic sibling for a 5-minute NLP training which scored and averaged each sibling's verbalizations and target verbal behaviors including imitation, answers, spontaneous speech, fill-ins, past tense, plurals, and length of sentence (Spector & Charlop, 2017, p. 1512). Results indicated that two of the three autistic siblings showed increased speech and gains in verbal behaviors; the neurotypical siblings learned and generalized NLP quickly; and 8-12 weeks post-intervention, two of the three autistic siblings either sustained or increased treatment gains (Spector & Charlop, 2017, p. 1519). These findings suggest that the involvement of neurotypical siblings in their autistic sibling's therapies could be beneficial for the autistic sibling's progress.

Family-Centered Music Therapy

A randomized controlled study conducted by Thompson et al. (2014) aimed to examine the effectiveness of family-centered music therapy (FCMT) in promoting social engagement among young children aged 4 to 6 with what was considered severe ASD. In this study, the severity of a child's ASD was evaluated through parent-rated assessment measures, along with clinical observation measures assessing different aspects of social and interpersonal behaviors including language, interactions and functioning at home and in the community, the parent's attitude toward parenting their child, and the child's musicing with a music therapist (Thompson et al., 2014). The parent-rated assessments included the Vineland Social-Emotional Early Childhood Scales (VSEEC), the Social Responsiveness Scale Preschool Version for 3-Year-Olds

(SRS-PS), the MacArthur-Bates Communicative Development Inventories, Words and Gestures (MBCDI-W&G), and the Parent-Child Relationship Inventory (PCRI). The clinical observation measure was the Music Therapy Diagnostic Assessment (MTDA; Thompson et al., 2014). Participants were randomly assigned to either the FCMT group (16 participants) or a control group (15 participants). The control group received standard care that incorporated their usual early-childhood intervention (ECI) programs and additional private speech, occupational, and/or Applied Behavior Analysis (ABA) therapies. The FCMT group received 16 weeks of music therapy sessions that incorporated turn-taking and joint attention activities, along with their standard care of ECI programs and additional private therapies (Thompson et al., 2014). The FCMT group showed significant improvements in social engagement and joint attention behaviors compared to the control group, with parents describing their child's improvements in "responding to others, imitation skills, sharing, co-operating, playing with others, and/or communicative behaviours in social contexts" (Thompson et al., 2014, p. 846).

An article written by Grace Thompson (2012) as part of her doctoral study focused on family-centered practice and a model for applying this practice to music therapy. Thompson draws upon other research which states that "family-centered practice is practitioners and families striving to work together in partnership" (Davis et al., 2002, as cited in Thompson, 2012, p. 109). She describes how the music therapist "works to promote a relationship between herself, the parent, and the child based on equality and collaboration" (Thompson, 2012, p. 110). In a case example summarizing an interaction with a young autistic boy named Ivan and his mother, Thompson (2012) observed Ivan's fascination with his mother's slide whistle playing. When Thompson invited Ivan to play his own whistle, it was clear that Ivan was mirroring his mother's movements, with intensely focused eye gaze and many moments of laughter. In another

case example, Thompson (2012) describes a moment within a music therapy session with Maxim, a 4-year-old autistic boy, and his mother, Naomi. At home, Maxim would often lie on the floor and was not very active, and this was a behavior that he displayed in sessions as well (Thompson, 2012). A song was improvised around Maxim's behavior, with lyrics about sleeping and quietness and then a pause in the music where Naomi would tickle Maxim (Thompson, 2012). At the end of the session, Naomi explained that joining Maxim's behavior, rather than asking him to participate in an entirely different activity that she led, ultimately allowed for more engagement between them (Thompson, 2012). In both of these examples, experiences in music therapy created pathways to connection between mother and child. Though these case examples stray from siblings together in family-centered therapy, it is important to highlight the impact that family-centered music therapy can have on various relationships within a family.

A book edited by Jacobsen and Thompson (2017) presents different therapeutic approaches and perspectives in music therapy when working in the family context. In Chapter 4, a case vignette explores music therapy in-home with a preschool-aged autistic child, Bernie, and his family consisting of a mother, father, and younger brother. Through the focus of this study on the mother-child dynamic, the idea of music therapy in the family context to strengthen relationships among all members is highlighted in a similar way to the Grace Thompson (2012) doctoral study. The chapter explains the concept of the participatory quality of family-centered music therapy, describing the music therapist's role of supporting "family members to be involved in music-making and the relationships possible within it" (Jacobsen & Thompson, 2017, p. 101). As Bernie and his mother progressed in music therapy, Bernie independently demonstrated affection through hugs and kisses to his mother and occasionally to the music therapist, as well as prolonged engagement in music activities (Jacobsen & Thompson, 2017, p.

108). Bernie's mother reflected on her experience, stating that music became part of her and Bernie's way of daily communication (Jacobsen & Thompson, 2017, p.109). The authors explore free improvisation in family-centered music therapy, showing that the music therapist can model "musically following the child's lead" and can "attune to the child's behaviors" through techniques such as "echoing the child's music-making, trying to play along in the same tempo as the child, accompanying the child's playing with another instrument, and making up a song about what the child is doing musically" (Jacobsen & Thompson, 2017, p. 108). They also describe the act of music-making as a mutually enjoyable activity (Jacobsen & Thompson, 2017) which in itself creates a different and exciting environment for new aspects of a relationship between two family members to emerge. This emphasis on fun, spontaneous music-making supports the idea that improvisational music therapy coupled with a family-centered model provides the potential for exploration of connection and communication between an autistic and neurotypical sibling dyad in music therapy.

Summary of Literature and Rationale

Autistic individuals and neurotypical individuals experience differing brain functions that impact daily life within interactions and relationships. Music therapy sessions, specifically improvisational music therapy sessions, allow individuals to explore various goal areas related to social, emotional, cognitive, and physical domains. Within the family context, autistic and neurotypical sibling relationships are present across a variety of settings in both individuals' lives. Therefore, the involvement of neurotypical siblings within the autistic sibling's family-centered therapies shines a light on the possibilities of benefits across the entire family dynamic.

Current research highlights family-centered music therapy, most often including parents. This study of siblings within improvisational music therapy will explore interaction and

relationships in a music therapy session within a relationship that is present in the family dynamic and beyond. The research question focusing this study is: How does the relationship between a neurotypical and autistic sibling dyad present in improvisational music therapy? Subquestions to the research question include: How do a neurotypical and autistic sibling dyad interact with one another within an improvisational music therapy session?, and How do a neurotypical and autistic sibling dyad interact with the music therapist within an improvisational music therapy session?

CHAPTER 3: METHODOLOGY

Research Objective

This study sought to investigate the relationship of a neurotypical and autistic sibling dyad within an improvisational music therapy session.

Research Design

The study implemented the qualitative methods of video microanalysis and thematic analysis of an archived music therapy session with the sibling dyad. Video microanalysis in music therapy highlights the subtleties of communication and social interaction with individuals whose primary forms of communication are nonverbal (Wosch & Wilgram, 2007, p. 29). Video microanalysis consists of the following four stages: Data Selection, Transcription, Pattern Generalization, and Interpretation. In Stage 1: Data Selection, short sequences of interactions within the session are reviewed, with the intention of an open analysis approach, taking an interest in all interaction patterns (Wosch & Wilgram, 2007). In the case of this study, the session for analysis was selected due to its spontaneous, naturalistic occurrence. Neither the siblings nor the researcher/music therapist planned for a session involving the dyad, and it was therefore the most natural possible scenario. The researcher/music therapist had worked with the autistic sibling individually one time before the analyzed session; the autistic sibling had worked with a different music therapist for several years prior. This session unfolded spontaneously, with the neurotypical sibling supporting the autistic sibling in entering the session room. The autistic sibling tended to show difficulty transitioning from the waiting room to the session room, often walking away from the waiting room and standing at the vending machine outside of the music therapy space. If the autistic sibling did enter the session room, he would tend to leave the

session room to join his neurotypical sibling and staff member assigned by the family to assist the autistic sibling in the waiting room or to walk to the vending machine. Before the analyzed session, the neurotypical sibling offered his arm to his autistic sibling, the autistic sibling took the arm, and the two siblings walked into the session room together. When the neurotypical sibling attempted to leave the space, the autistic sibling would attempt to leave with him, so the researcher/music therapist invited the neurotypical sibling to come into the session room and remain in the space for the duration of the session. Within the session, specific musical experiences were chosen for analysis because they were initiated by one of the two siblings.

In Stage 2: Transcription, the researcher starts with a classical music notation system to represent each selected musical moment, and afterward makes note of gestural and facial movements either above or below the notation lines, with the intention to highlight subtle expression and interaction (Wosch & Wilgram, 2007). Stage 3: Pattern Generalization includes horizontal and vertical analysis. Horizontal analysis examines chains of interactions across time, while vertical analysis explores chains of interaction across material with the intention of uncovering patterns (Wosch & Wilgram, 2007). Stage 4: Interpretation characterizes the patterns that have emerged (Wosch & Wilgram, 2007).

Thematic analysis was implemented to extract themes across the individually analyzed music experiences. Thematic analysis entailed the following phases: gaining familiarity with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report (Braun & Clarke, 2006).

Participants

The researcher recruited a sibling dyad consisting of an autistic individual and a neurotypical individual for this study.

The inclusion criteria for the autistic sibling were as follows:

1. Diagnosis of Autism Spectrum Disorder as outlined by the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (5th edition), and as confirmed by the facility providing music therapy services;
2. Between the ages of 13 and 18 years; and
3. Enrolled in music therapy for at least one year prior to the study.

The inclusion criteria for the neurotypical sibling were as follows:

1. Typically developing, as confirmed by a parent, and
2. Between the ages of 13 and 18 years.

Recruitment

Following Institutional Review Board (IRB) approval, the researcher assessed their own caseload and previously recorded music therapy sessions that fit the dyad criteria at the music therapy facility where they are employed. The researcher obtained permission from an authorized individual at the facility, and the potential sibling participants and their parents were informed of the study and invited to indicate their interest via email. From there, informed consent from the parent and assent from the neurotypical sibling were obtained in order for the researcher to view an archived video recording. The assent forms for the neurotypical sibling included all information from the parent consent form explained in simple language. An assent form was provided for the autistic sibling (A), and A's mother reported that A could not complete the form. These forms were explained via a scheduled Zoom call, during which participants and their parents were in a comfortable environment and had the opportunity to ask questions live. Participants and their parents were informed that they could withdraw from the study at any time and for any reason without penalty.

Brief History of Sibling Dyad

The neurotypical sibling (identified by the generic initial N) is 14 years of age, and often accompanies the autistic sibling (identified by the generic initial A) and A's staff member to A's weekly music therapy sessions.

A is 19 years of age, and has been attending music therapy sessions since 2020. A used to enjoy horseback riding, though he no longer participates in this activity due to safety concerns. As reported by A's mother, A enjoys music very much. He listens to all types of music, ranging from Frank Sinatra and Metallica to Twinkle Twinkle and Barney. His family will often bond with one another through long drives around their neighborhood while playing music. A also enjoys traveling and has a love for food. A has limited verbal communication, often providing one- to three-word responses. A responds well to visual representations and pictures, along with numbered tasks.

Data Collection

Research unfolded in a natural setting through observation and analysis of an archived video recorded session. Because the selected session took place prior to the beginning of the study, both the music therapist and the clients participated in the session in their most natural way, without influence by the parameters of the study. Microanalysis of the session followed the steps outlined above.

Data Protection

All data were stored and protected on a HIPAA-compliant, encrypted and password protected flash drive with access limited to the researcher. The archived video was uploaded to

the researcher's flash drive via the HIPAA-compliant Google Drive account at the music therapy facility. The researcher viewed the session video in a private space with headphones to ensure others could not hear or see the content of the session. The archived video recording will be maintained in secure storage on the flash drive for a minimum of 3 years following completion of the study in order to meet necessary verification standards, after which the data on the flash drive will be reset to factory settings, and any files within the device will be permanently destroyed.

The researcher protected participant identity by using generic initials (A for the autistic sibling and N for the neurotypical sibling) to refer to them throughout the study. Any identifying information was omitted from all data.

Data Analysis

Data from the music therapy session video were collected and analyzed through microanalysis, "a detailed method investigating microprocesses. Microprocesses are processes and changes/progressions within one session of music therapy" (Wosch & Wigram, 2007, p. 22). The analysis of interaction through microanalysis incorporated a "holistic perspective on communication" (Wosch & Wigram, 2007, p. 30) taking into account both music and prosody, including the words, gestures, facial expression, and body movements observed within the video recorded session (Wosch & Wigram, 2007, p. 30). As outlined above, the steps of microanalysis include data selection, transcription, pattern generalization through horizontal and vertical analysis, and interpretation (Wosch & Wigram, 2007, pp. 30-31). The open analysis approach to the selected video recorded session, in contrast to a problem-based approach, examined all interaction patterns of the participants, including various examples of a lack of response or

"wished-for" responses (Wosch & Wigram, 2007, p. 31). Within the transcription step, the open analysis approach necessitated more detailed transcriptions than a problem-based approach (Wosch & Wigram, 2007, p. 32). The researcher used the music notation system Noteflight to transcribe melodies, harmonies, rhythms, tempi, and dynamics, and added descriptions of gestural/facial movements above or below the notation line (Wosch & Wigram, 2007, p. 32). Within the pattern generalization step, horizontal and vertical analyses were conducted. Horizontal analysis focuses on "chains of interactions," while vertical analysis focuses on interaction patterns (Wosch & Wigram, 2007, p. 32). Vertical analysis led to review of the horizontal analysis, and this process was repeated until no new patterns emerged (Wosch & Wigram, 2007, p. 32). Within the step of interpretation, any guesses and/or suppositions were reconstructed into descriptions of the "practices" (here interaction patterns) that unfolded in each experience, and any deviation from a given pattern was noted (Wosch & Wigram, 2007, p. 34).

Trustworthiness

To establish the dependability and confirmability of this study, the researcher ensured that the process of investigation was "logical, traceable, and clearly documented" and demonstrated "how conclusions and interpretations have been reached" (Tobin & Begley, 2004, as cited in Nowell et al., 2017, p. 3). The researcher kept a self-reflective journal to remain mindful of her own stance, documenting her values, feelings, and reactions at all stages of the research process. Self-reflection was essential for the researcher's awareness of her perspective through her lived experience, along with her perspective as the music therapist in the session being studied. The researcher established credibility through peer debriefing and consultation with a thesis committee for multiple perspectives on the process of research (Nowell et al., 2017), and through prolonged engagement with the data involving multiple reviews of the

archived video. The method of microanalysis brought aspects of the music to the forefront which would not have been noticed otherwise, ultimately creating intense immersion in the data. The complexity of notating and annotating required frequently revisiting the video data to check for accuracy and completeness. This also allowed for different forms of interaction with the data, including both a software and manual notation transcription to ensure accuracy. The participant's mother was also offered opportunity to review the session transcription throughout the research.

CHAPTER 4: RESULTS

The following themes and subthemes emerged in relation to the research question and subquestions. The researcher analyzed three different improvised music experiences that occurred within the session: an accordion experience, a wind chimes and clapping experience, and a shakers experience. These experiences were chosen for analysis because they were initiated by one of the siblings, either through visual cues or independent physical engagement with the instrument. The researcher supported the siblings' interactions with various improvised harmonic progressions and accompaniment patterns on the guitar and created a musical space, using one of Bruscia's (1987) 64 improvisational techniques known as *holding*, within which the siblings could explore. Though the researcher encouraged interaction between the siblings in other experiences within the session, the significance of these three chosen experiences lies in their initiation by the siblings. This showed their comfort with one another and their desire to interact.

The video microanalysis identified significant moments within the music experiences that highlight the siblings' engagement with each other, the music therapist, and the music throughout the session. The neurotypical sibling, autistic sibling, and music therapist are referred to as N, A, and MT, respectively. Each of the three experiences will be presented through a brief introduction to how the experience came to be, followed by a table with a description and interpretation of each significant moment within the experience, and supplemented with a notated music excerpt from the full music manuscript. Following the presentation of these music experiences, the results of thematic analysis across the experiences will be examined.

Video Microanalysis

Accordion Experience

Preceding the accordion experience, A is clapping his hands and walking the length of the room. MT accompanies his clapping with an extension of their familiar greeting song, using the same C Major chord progression while altering the rhythmic patterns. A stops walking, picks up the accordion on top of the piano, and then walks directly toward N. N holds his hands out and quickly stands up to meet A, opening the buttons on the side of the instrument so that it would fully open, with verbal directions from MT. In this encounter, A uses nonverbal cues to initiate an interaction with N. By holding out his hands, N immediately demonstrates his understanding of A's offering. A demonstrates trust in N by releasing tension on the instrument and allowing N to explore further.

Table 1 provides descriptions and interpretations of significant interactions notated and annotated on the extended, microanalyzed manuscript of the accordion experience.

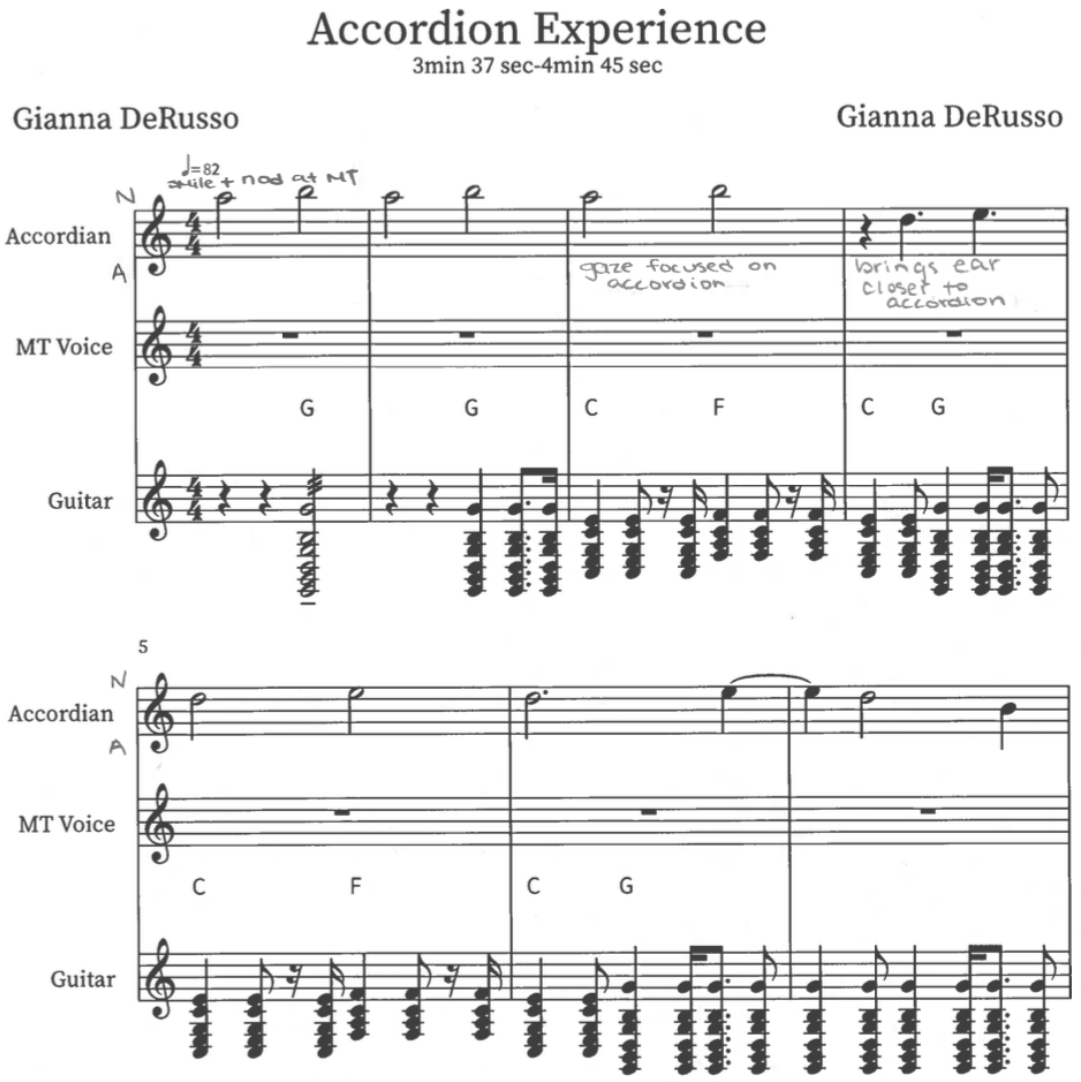
Table 1

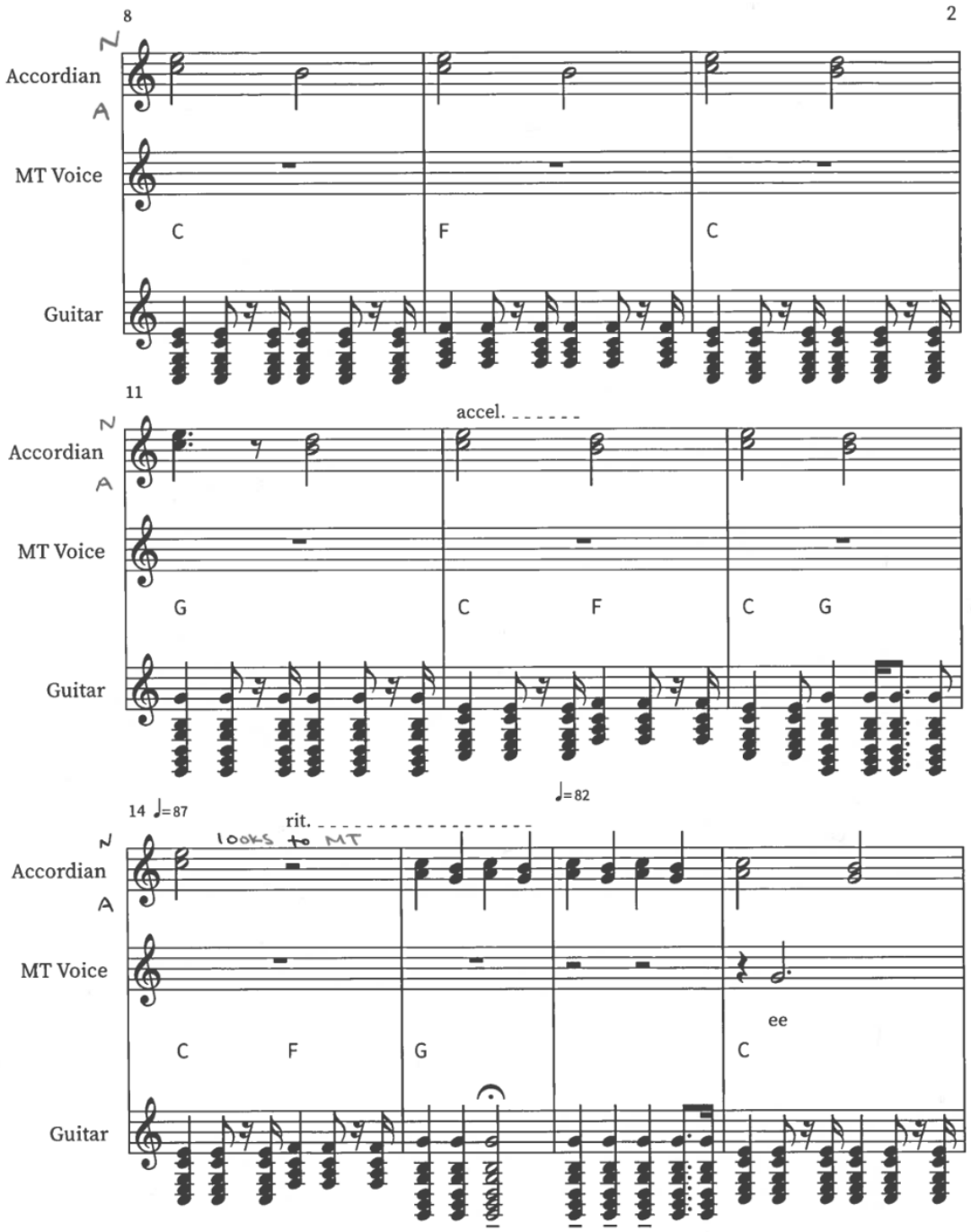
Accordion Experience Analysis

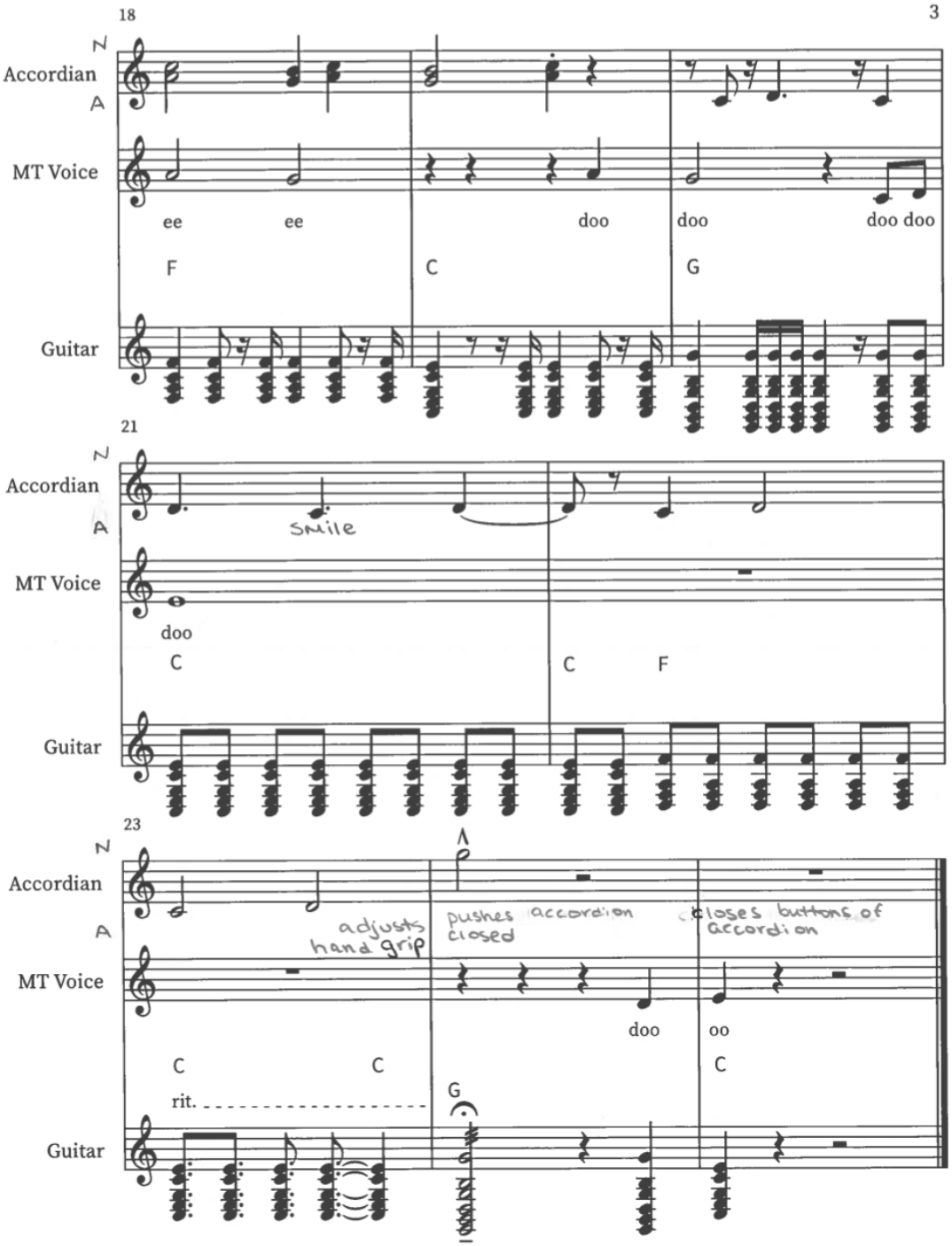
Description	**Interpretation**
Measures 1-4 N looks to MT and smiles when the instrument begins to sound. A's eye gaze is focused on the instrument during this time. He brings the instrument closer to his ear, and they begin to play together.	N shows nervousness in this first interaction, waiting for verbal cues from MT. A focuses on the instrument during interaction between MT and N, showing patience and trust that N will provide guidance.
Measure 8 Harmony is created on the accordion through N and A pressing buttons together. MT continues to provide accompaniment on guitar	A notices N's playing and independently chooses to engage through mirroring N's button pressing while adding his own musical ideas.

with a set tempo.	
Measure 12 Harmony is consistent, with A and N each holding the same button on the accordion. An accelerando occurs. MT reflects this within the guitar accompaniment through an increase in tempo.	A and N are excited by the layered music they have created, and this excitement manifests in more playful and faster playing.
Measure 21 The tempo of the music has slowed. There is a shift in N and A's hand placements on the accordion, and harmony is no longer present. A smiles.	A seems to notice this shift, responding with a smile while continuing to focus his eye gaze on the instrument. N's continuous movement of the instrument to create sound shows his support of A and enjoyment of the experience.

Figure 1.1: Music Manuscript for Accordion Experience




8
2
Accordian
MT Voice
C
F
C
Guitar
11
accel.
Accordian
MT Voice
G
C
F
C
G
Guitar
14 ♩=87
♩=82
rit.
looks to MT
Accordian
MT Voice
C
F
G
ee
C
Guitar


18
3
N
Accordian
A
MT Voice
ee ee doo doo doo doo
F C G
Guitar
21
N
Accordian
A
smile
MT Voice
doo
C C F
Guitar
23
N
Accordian
A
adjusts hand grip
pushes accordion closed
closes buttons of accordion
MT Voice
doo oo
C C C
rit.
G
Guitar

Wind Chimes and Joint Clapping Experience

Preceding the wind chimes and joint clapping experience, MT, N, and A explore the desk bells, and A puts each desk bell away into the instrument closet as N sits in the chair next to the instrument closet. A walks away from the instrument closet, MT continues to provide guitar accompaniment, and MT sings a goodbye phrase to the bells followed by "What's next?" to encourage A to initiate a new idea. N uses nonverbal, visual cues to initiate a musical interaction with A at the windchime, standing up and playing the lower tones. A immediately joins him at the instrument, MT creates a lulling arpeggiated accompaniment on the guitar, and the experience begins to take shape.

Table 2 provides descriptions and interpretations of significant interactions indicated on the extended, microanalyzed manuscript of the wind chimes and joint clapping experience.

Table 2

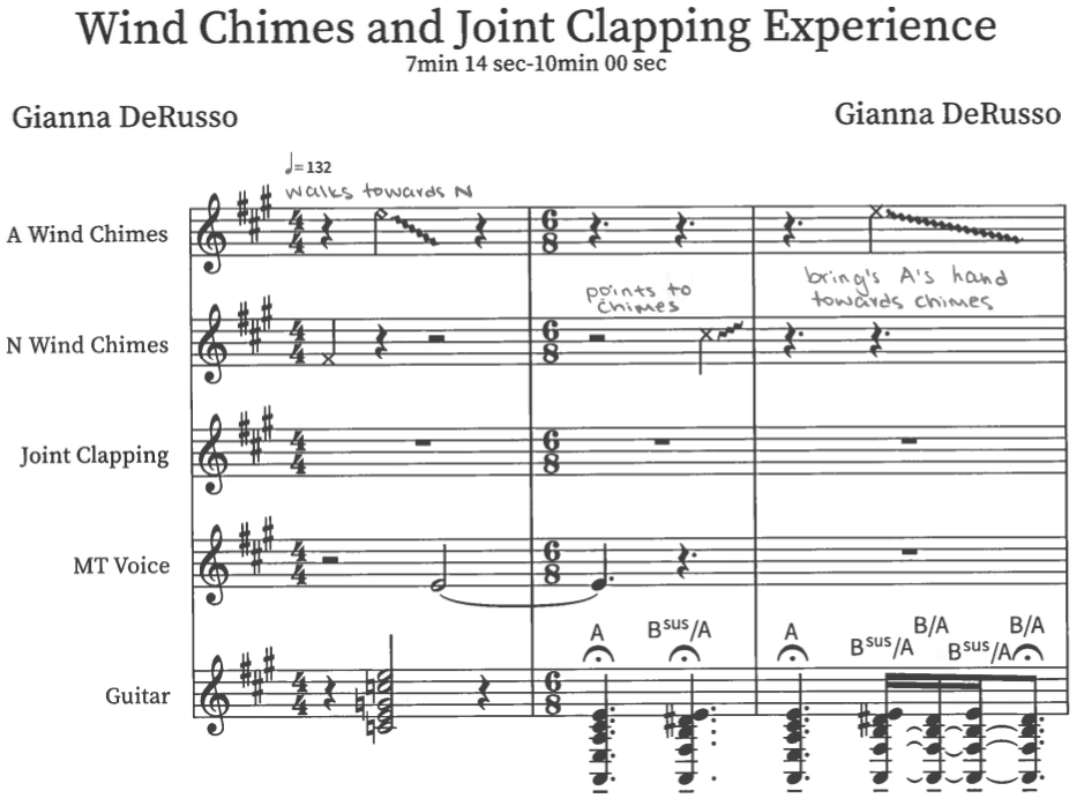
Wind Chimes and Joint Clapping Experience Analysis

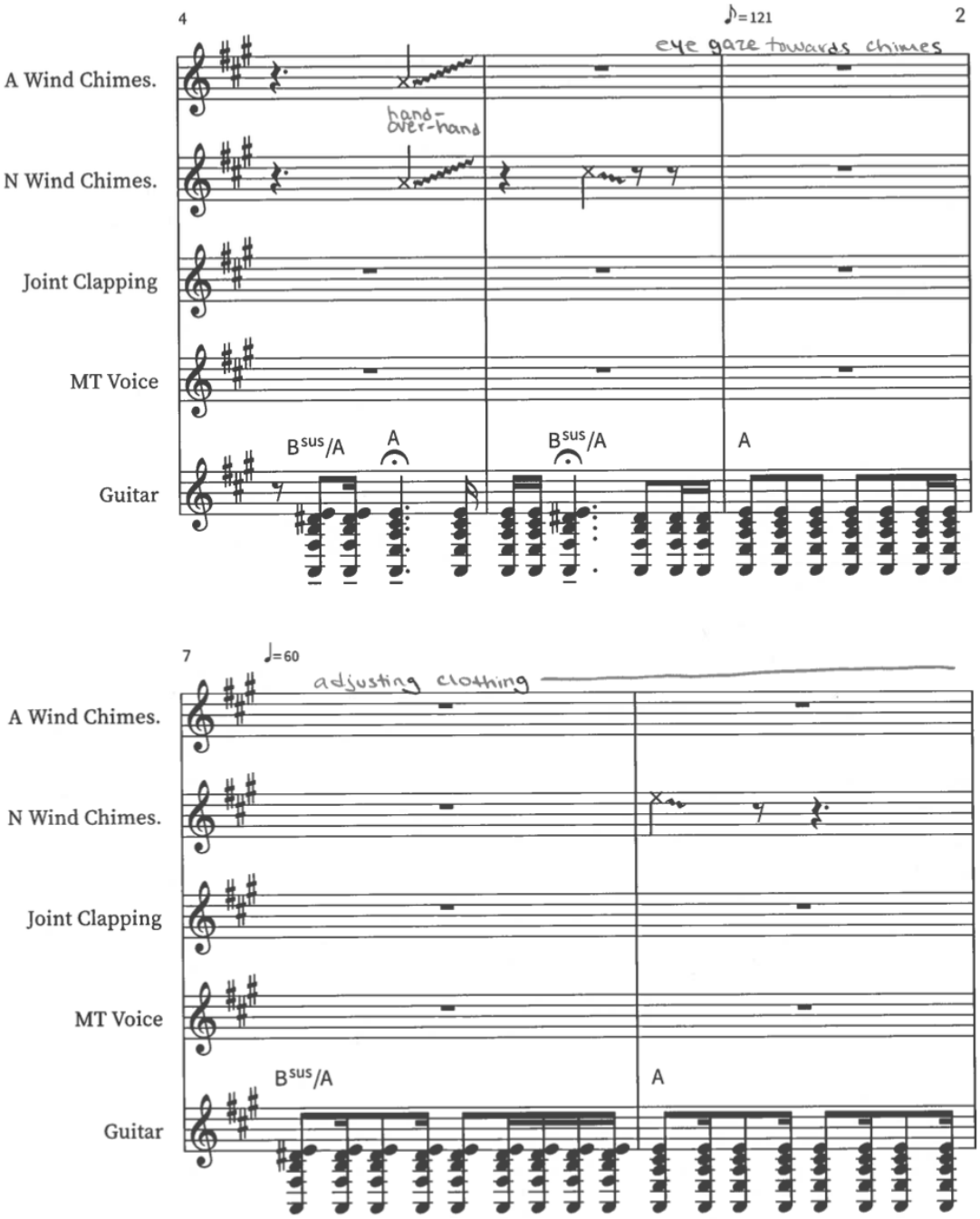
Description	**Interpretation**
Measure 3 N brings A's hand toward the wind chimes and releases A's hand. A independently plays the chimes from highest to lowest tone. MT continues to provide an arpeggiated guitar accompaniment in the A Lydian mode.	N initially models playing the chimes while allowing A to explore independently. When N's modeling does not elicit a response from A, N offers hand-over-hand facilitation, and A responds to this physical support. A appears to feel comfortable exploring the instrument independently.
Measure 4 N provides hand-over-hand assistance to A in playing the chimes from the lowest to the highest tone, and A's eye gaze remains focused on the instrument throughout.	N continues to explore ways to engage with A, moving into sharing the instrument, similarly to how that A initiated sharing an instrument in the first experience.
Measures 7-10 N continues briefly exploring the chimes while A adjusts his clothing. As A continues	N leaves space for A to engage when he is ready to do so, though when a non-musical behavior continues for an extended period of

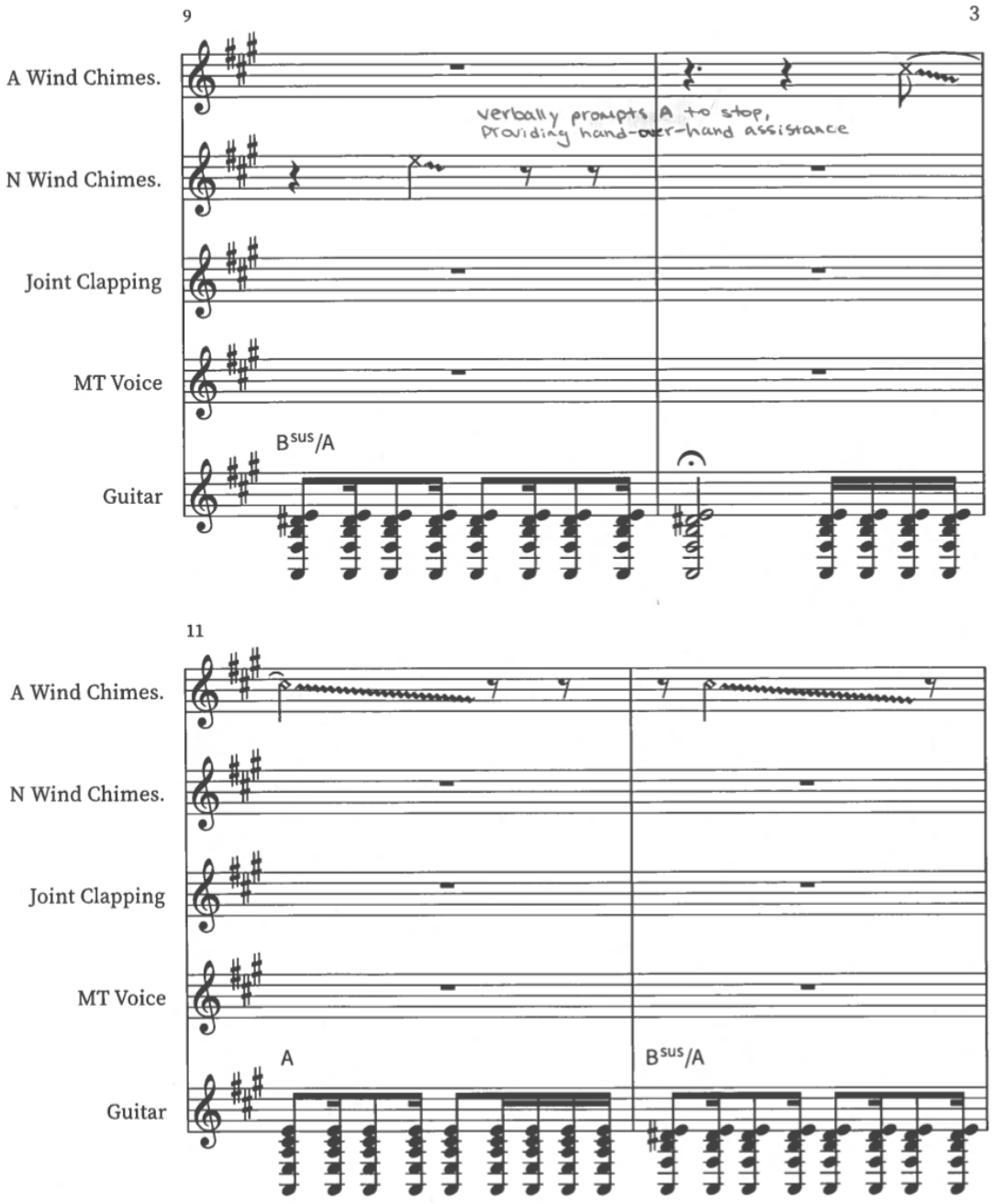
to adjust his clothing, N responds with a verbal prompt "stop" and provides hand-over-hand assistance to guide A's hand away from his clothes and back to the wind chimes. MT continues to provide accompaniment on the guitar.	time, N utilizes a verbal prompt and hand-over-hand assistance to stop the behavior and redirect A back to the music, continuing to seek engagement and connection with A.
Measure 16-18 A is adjusting his clothing, and N provides verbal prompts to stop, and hand-over-hand assistance to play the wind chimes together from the highest to the lowest tone. A starts to turn his body away from the chimes, and N places his hands around A's hands from below and begins to move them up and down.	N allows less time for this behavior to occur before redirecting. After playing the chimes together, N realizes that A seems to be disengaging from this instrument and turns to physical touch in a new way to re-engage him.
Measure 18 N and A entrain to the quarter note beat of the accompaniment from MT on guitar with held hands, and on beat 4, A moves his hands out of N's light grasp, and they create a clapping sound with N's hands at the bottom and A's hands at the top.	N provides physical support to A to entrain to the beat, and within three beats, A moves his hand placement to create a new element in the music: a clapping sound. N allows A to depart from his grasp, trusting that A will remain in the moment and engage with him. N and A's ability to understand each other within three beats and to move into clapping nonverbally shows the strength in their bond and their understanding of how to connect.
Measures 20-22 A's gaze is focused on his and N's hands, and N's eye gaze turns briefly toward MT.	N seems to be looking to MT for confirmation and guidance, while A focuses his gaze toward his and N's hands and what will happen next in their shared activity.
Measure 22 A initiates hand movements by holding N's hands and alternating upward and downward movements on each side.	A initiates hand movements similar to N's in measure 18, though he makes them his own by making one side go up and the other go down, alternating within the tempo of the accompaniment. A maintains a connection with N by reintroducing the movement N initiated a few measures prior.
Measures 34-35 MT notices a disconnect between N and A in the music, with A rubbing his eyes and N looking down at his hands. MT stops singing and allows the Bsus/A chord in measure 34 to be held. N notices the silence first and plays the wind chimes starting from the lowest tone.	Noticing a disconnect between A and N at this moment, MT removes her voice from the texture of the music to leave space while the Bsus/A chord continues to ring. A and N notice this within two beats, which shows that their engagement with the music was still present, even if they visually appeared

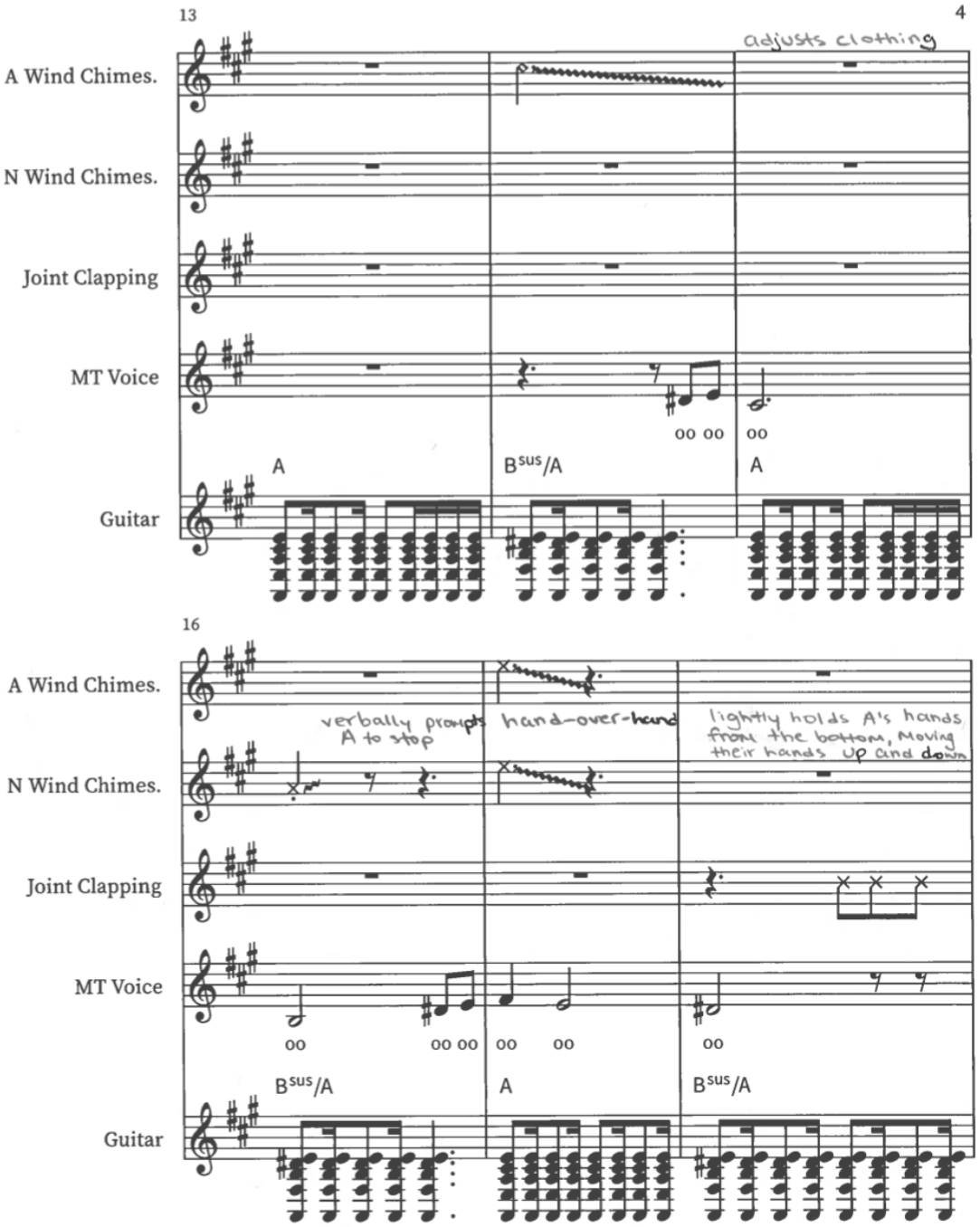
Within one beat, A notices this and plays the wind chimes starting from the highest tone, meeting N in the middle of the instrument.	disengaged.
Measure 36 A plays the wind chimes from lowest tone to highest tone for the first time.	A seems to be internalizing N's way of playing and exploring it independently.
Measures 39-42 A moves away from the wind chimes to touch N's jacket on a nearby chair. N sits in the chair and presses his back to the jacket so that A cannot touch it. A independently walks toward the wind chimes and slightly picks them up off the floor twice. N points to the wind chimes and stands up, and A steps back. N plays the lower tones of the wind chimes, and A plays the highest tones less than a beat after.	N provides nonverbal cues to reengage A in the music, and when A takes a step back, he shows curiosity about N's actions. When A plays soon after N, this could represent A's desire to engage with N in response to N's modeled playing.
Measure 43 A plays the chimes from the highest tones to the center of the instrument, turning his body 180 degrees as he swings his arm, first toward MT and then toward the wall. MT adds improvised vocalizations with tones within her chord progression on guitar.	MT allows A to move freely and mirrors these larger movements with some swaying and vocalization. MT is adding texture to the music to support A in the louder soundscape, which seems to encourage A to explore the combination of ascending and descending playing on the windchimes. A incorporates all the ways that he and N have played the instrument throughout the experience, while adding movement to personalize his playing.

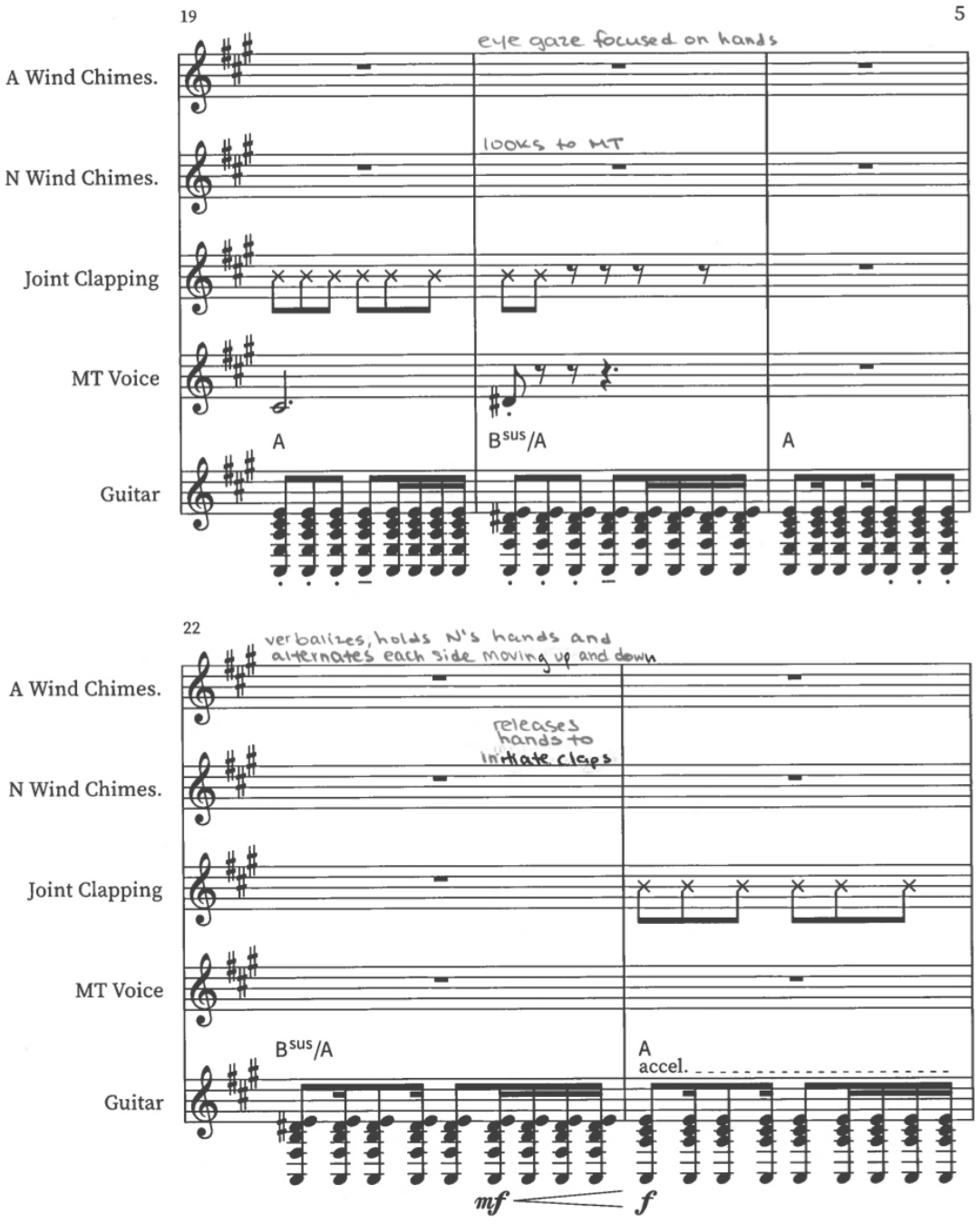
Figure 2.1: Music Manuscript for Wind Chimes and Joint Clapping Experience

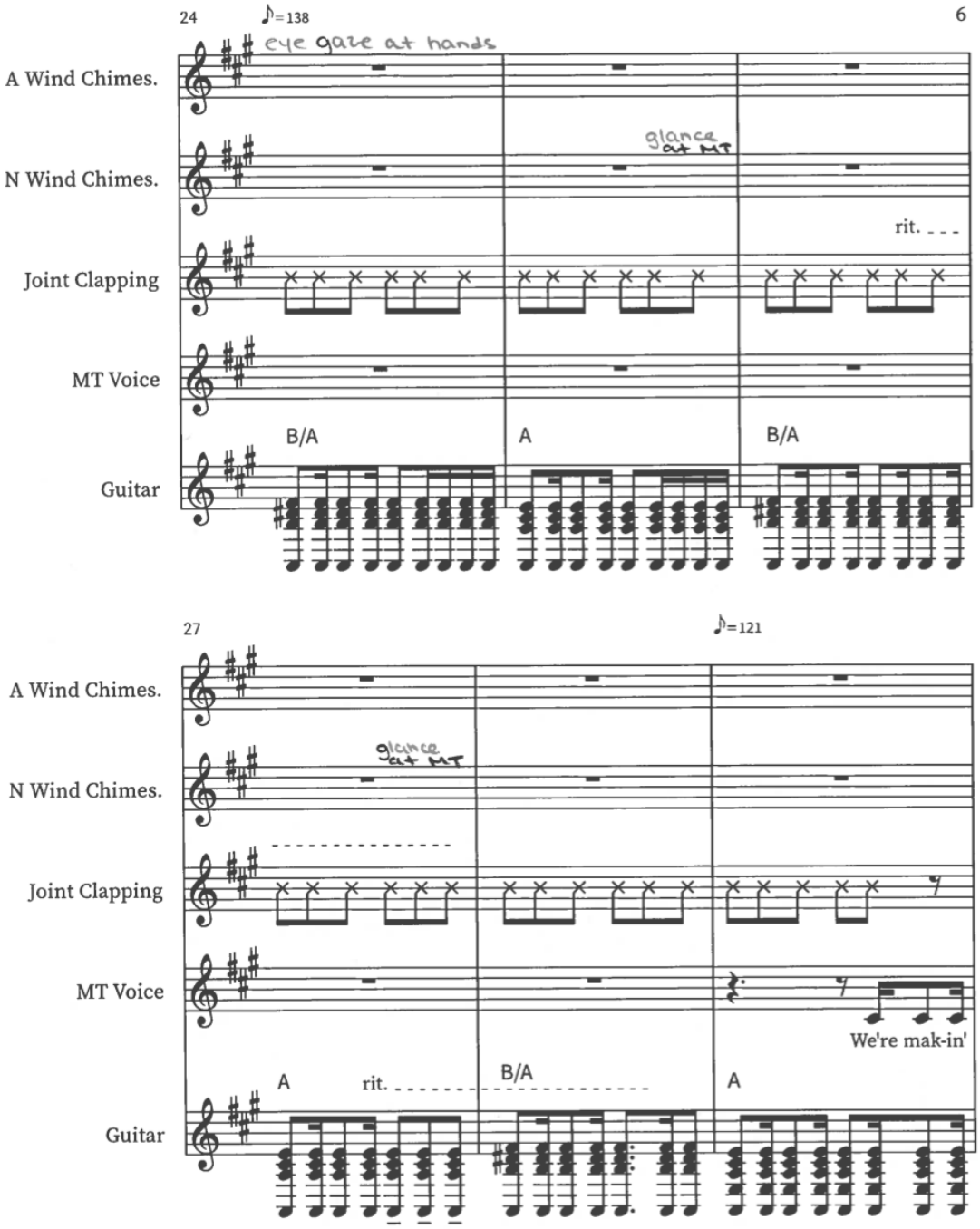


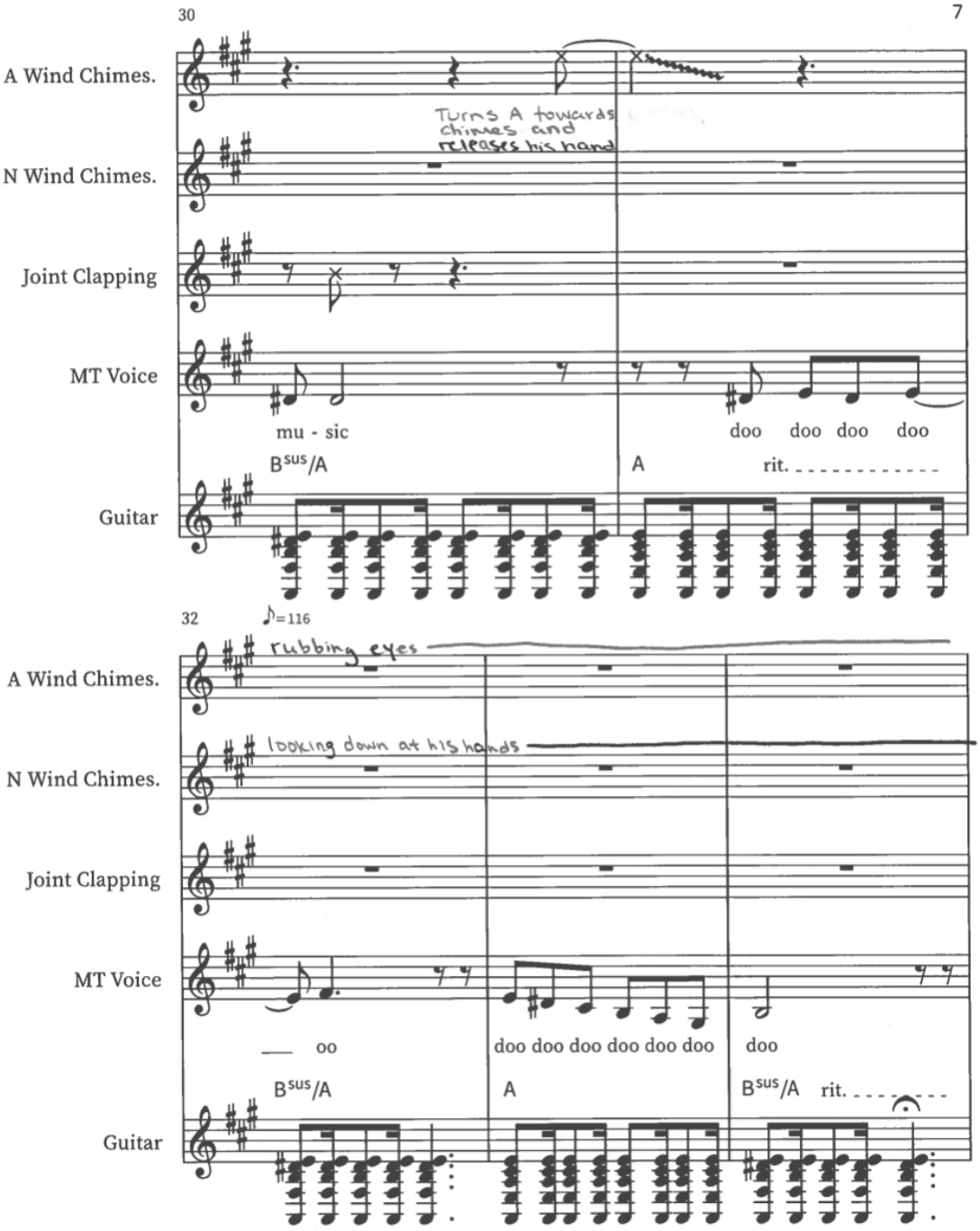

4
♪=121
2
eye gaze towards chimes
A Wind Chimes.
N Wind Chimes.
hand-over-hand
Joint Clapping
MT Voice
Guitar
B sus /A
A
B sus /A
A
7
♩=60
adjusting clothing
A Wind Chimes.
N Wind Chimes.
Joint Clapping
MT Voice
Guitar
B sus /A
A

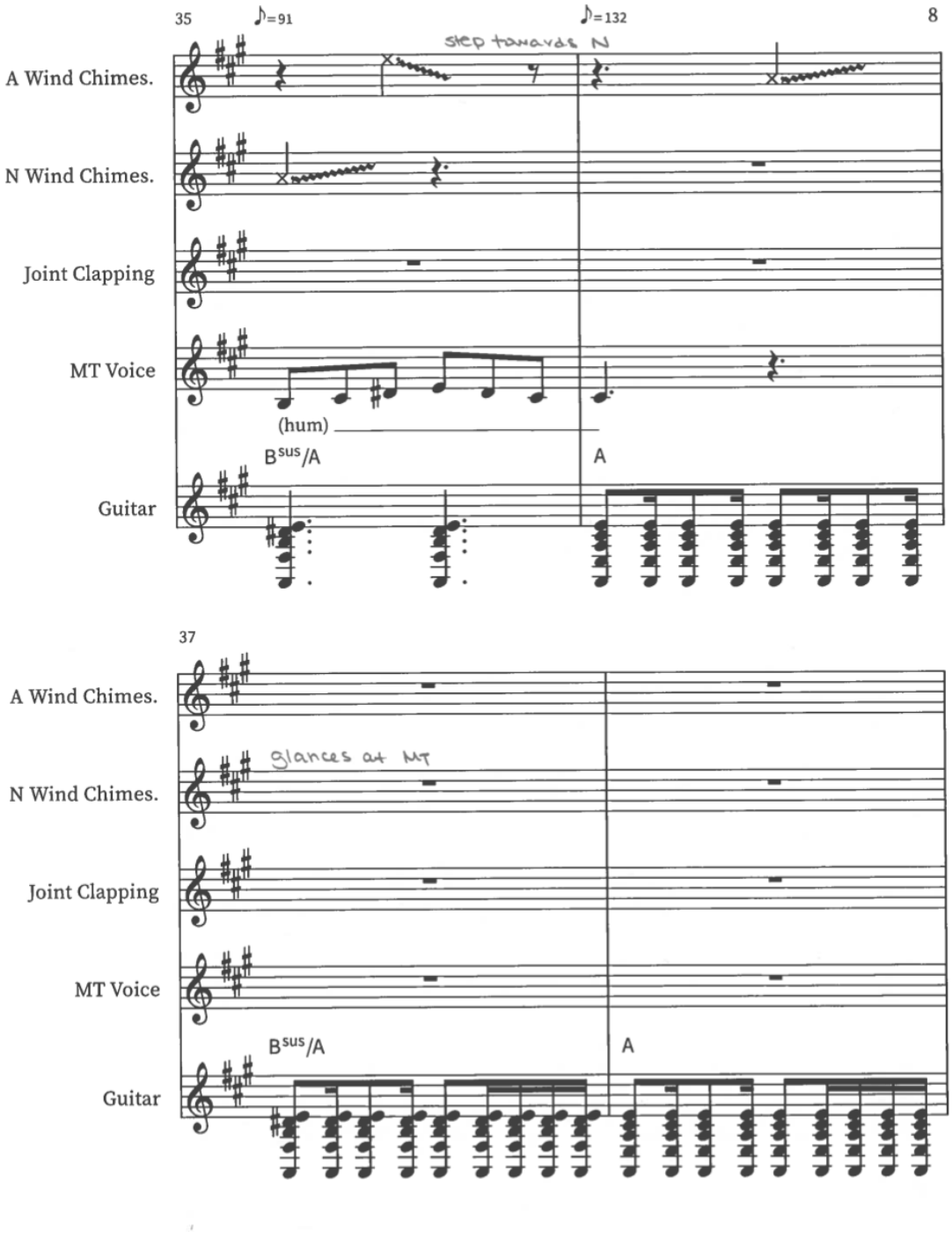

9
3
A Wind Chimes.
N Wind Chimes.
Joint Clapping
MT Voice
Guitar
verbally prompts A to stop,
Providing hand-over-hand assistance
Bsus/A
11
A Wind Chimes.
N Wind Chimes.
Joint Clapping
MT Voice
Guitar
A
Bsus/A

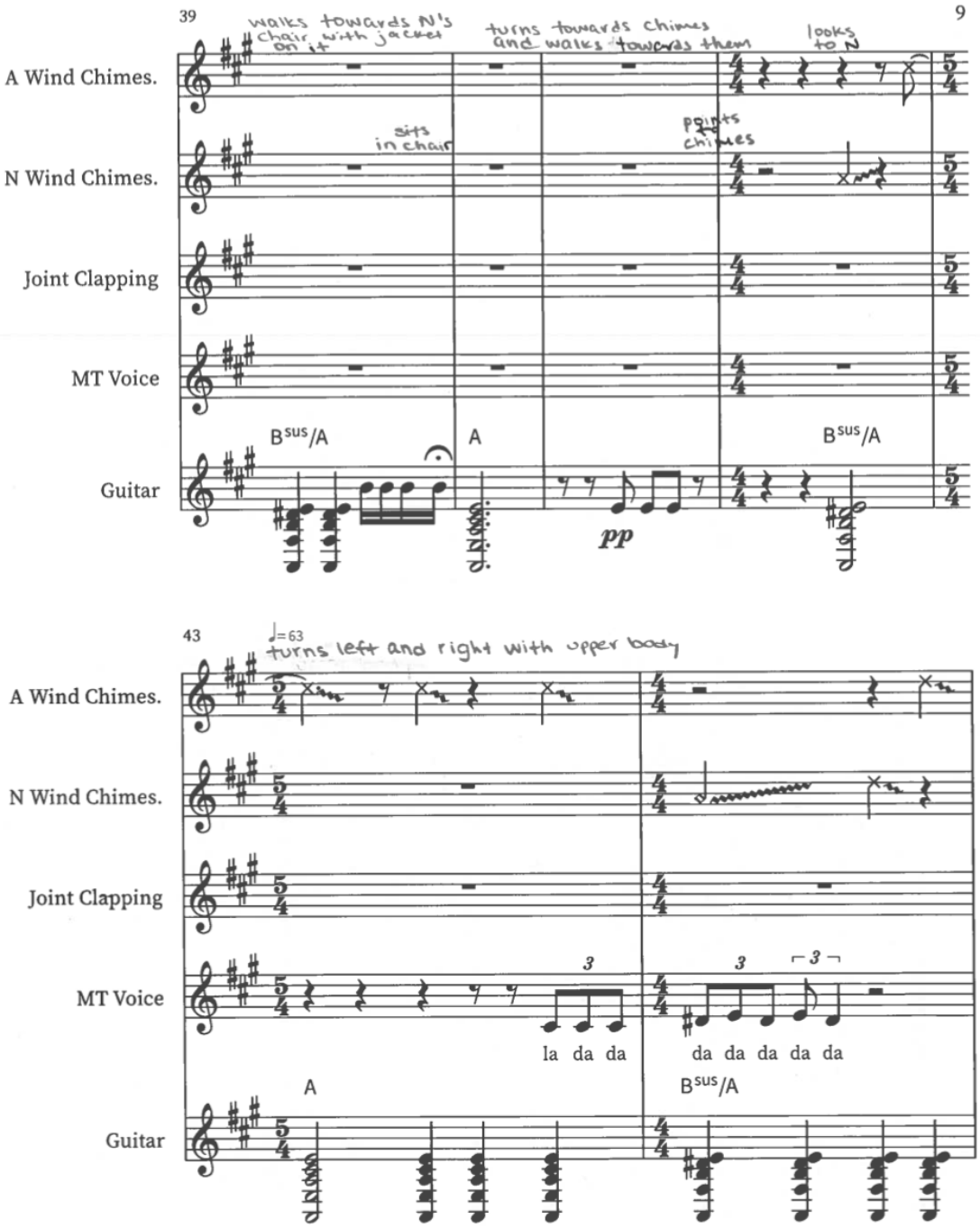

13
4
adjusts clothing
A Wind Chimes.
N Wind Chimes.
Joint Clapping
MT Voice
Guitar
A
B^sus/A
A
16
verbally prompts A to stop
hand-over-hand
lightly holds A's hands from the bottom, Moving their hands up and down
B^sus/A
A
B^sus/A

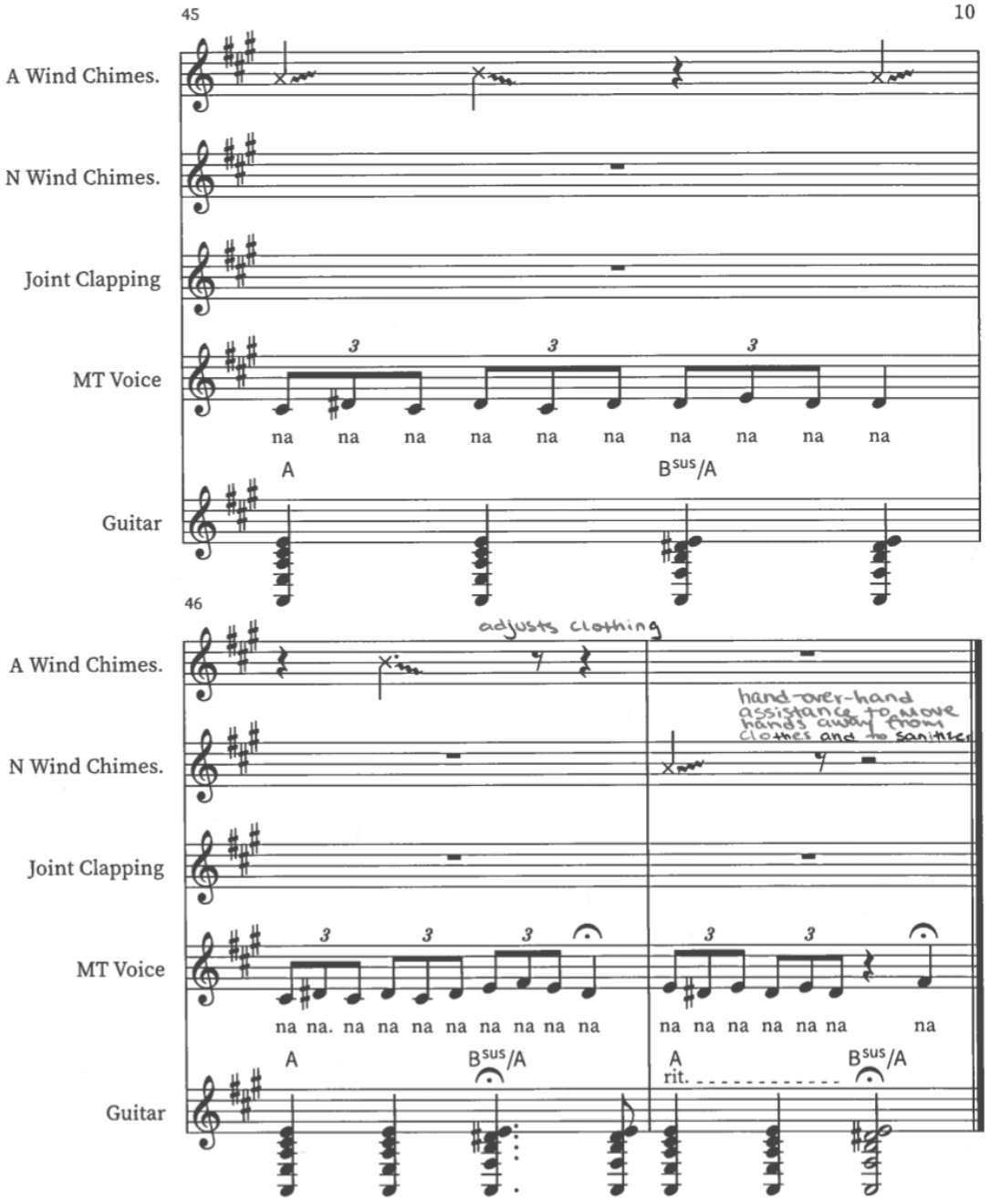

19
5
eye gaze focused on hands
A Wind Chimes.
N Wind Chimes.
looks to MT
Joint Clapping
MT Voice
Guitar
A
B sus /A
A
22
verbalizes, holds N's hands and alternates each side moving up and down
releases hands to initiate claps
B sus /A
A
accel.
mf
f


24
♪=138
6
eye gaze at hands
A Wind Chimes.
N Wind Chimes.
glance at MT
rit.
Joint Clapping
MT Voice
B/A
A
B/A
Guitar
27
♪=121
A Wind Chimes.
N Wind Chimes.
glance at MT
Joint Clapping
MT Voice
We're mak-in'
A
rit.
B/A
A
Guitar


30
7
A Wind Chimes.
N Wind Chimes.
Joint Clapping
MT Voice
Guitar
Turns A towards chimes and releases his hand
mu - sic
doo doo doo doo
B^sus/A
A
rit.
32
♪=116
rubbing eyes
looking down at his hands
oo
doo doo doo doo doo doo
doo
B^sus/A
A
B^sus/A
rit.


35
♪=91
♪=132
8
step towards N
A Wind Chimes.
N Wind Chimes.
Joint Clapping
MT Voice
(hum)
Guitar
B^sus/A
A
37
A Wind Chimes.
glances at MT
N Wind Chimes.
Joint Clapping
MT Voice
Guitar
B^sus/A
A


39
walks towards N's chair with jacket on it
turns towards chimes and walks towards them
looks to N
9
A Wind Chimes.
N Wind Chimes.
sits in chair
points to chimes
Joint Clapping
MT Voice
Guitar
B sus /A
A
B sus /A
pp
43
♩=63
turns left and right with upper body
A Wind Chimes.
N Wind Chimes.
Joint Clapping
MT Voice
3
3
3
la da da
da da da da da
Guitar
A
B sus /A


45
10
A Wind Chimes.
N Wind Chimes.
Joint Clapping
MT Voice
na na na na na na na na na na
A
Bsus/A
Guitar
46
adjusts clothing
hand-over-hand assistance to move hands away from clothes and to sanitize
A Wind Chimes.
N Wind Chimes.
Joint Clapping
MT Voice
na na. na na na na na na na na
na na na na na na na
A
Bsus/A
A
rit.
Bsus/A
Guitar

Shakers Experience

Preceding the shakers experience, MT creates an improvised song about movement using a Dm, C, Bb, and A progression, based on A's body and hand movements. A is vocalizing, and N is tapping his leg to the beat of the accompaniment. A starts to clap, N joins him, and A taps on the piano with a similar rhythmic pattern. There are shakers on top of the piano, as MT often leaves one or two instruments there for A to explore if he chooses. A independently picks up the shakers and begins walking around the room while playing. In past sessions, A moved instruments from the top of the piano into the instrument closet with little to no exploration. A's desire to engage with this instrument and then to engage independently before sharing with his sibling shows growth for A toward his goals of engaging in meaningful music experiences.

Table 3 provides descriptions and interpretations of significant interactions from the extended, microanalyzed manuscript of the shakers experience.

Table 3

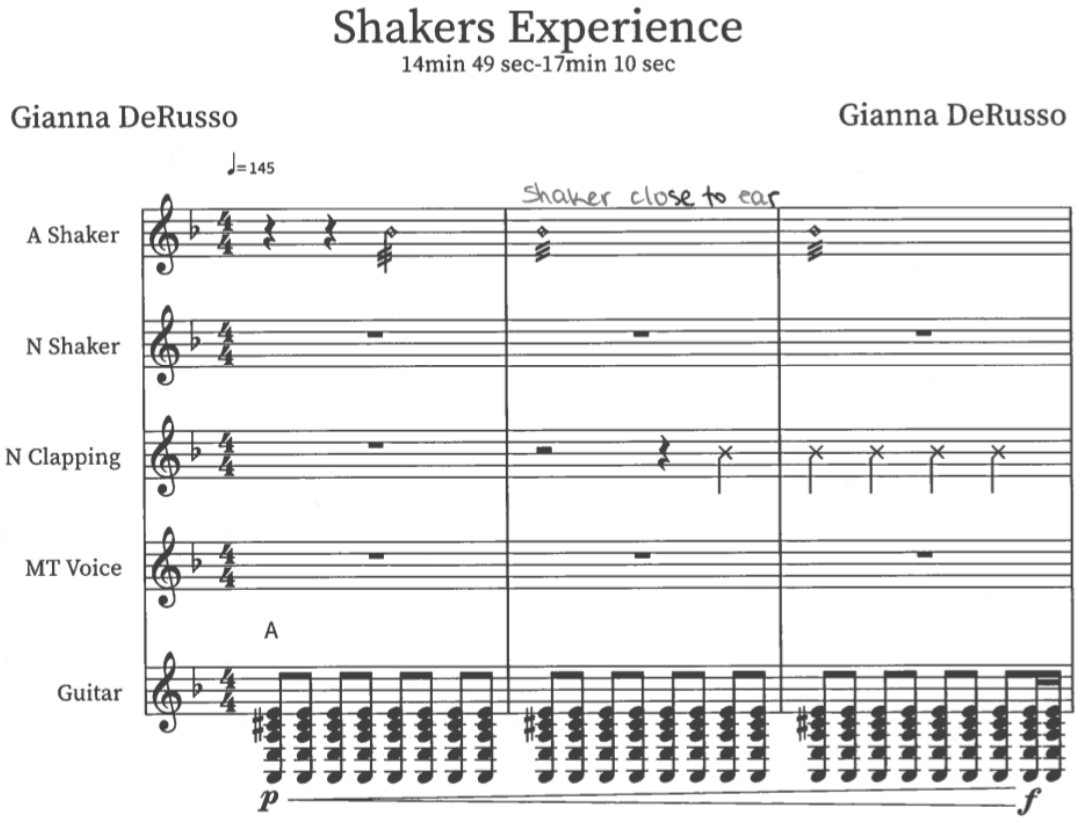
Shakers Experience Analysis

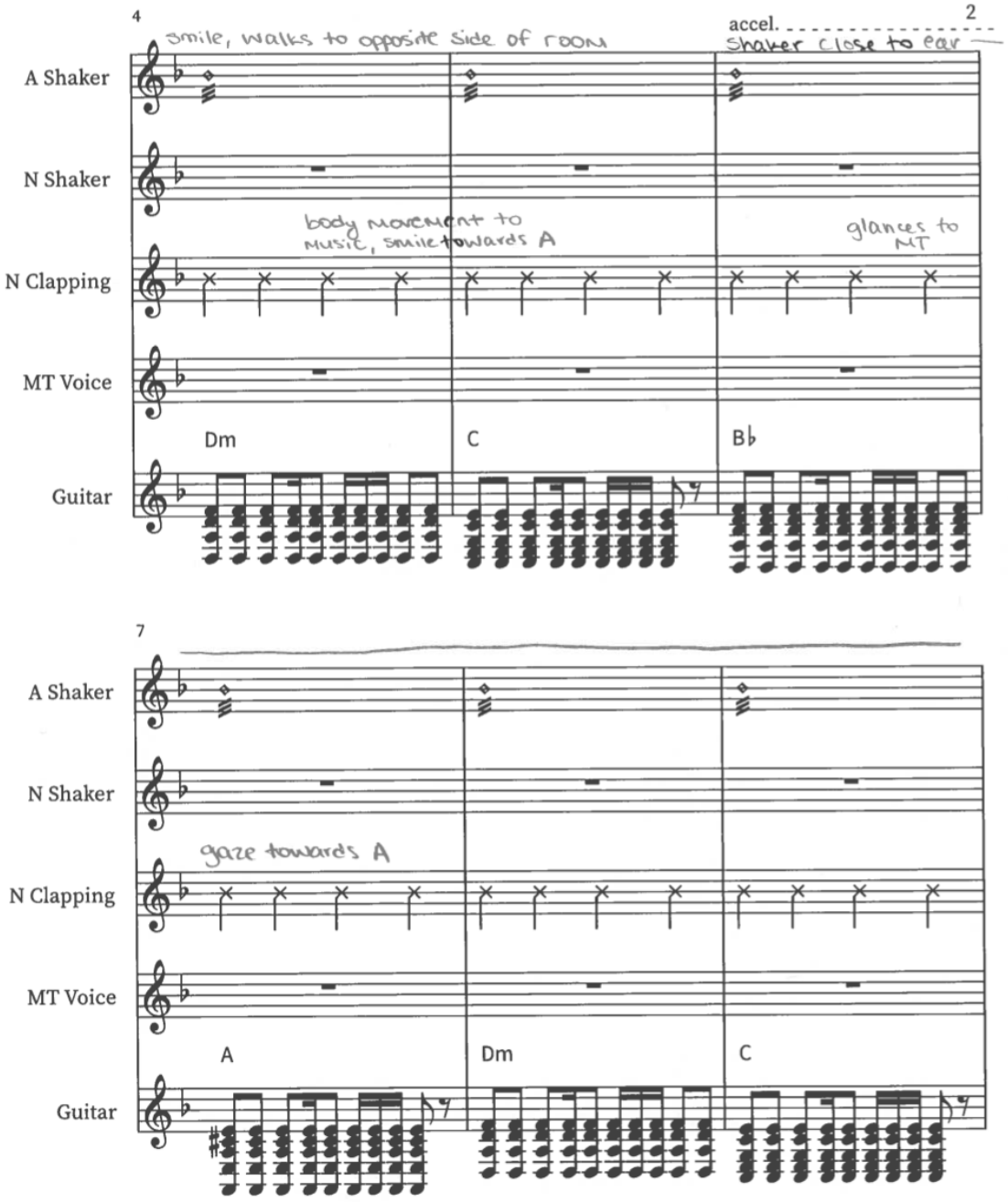
Description	**Interpretation**
Measures 2-3 A brings the shakers closer to his ear and maintains a fast-paced rhythmic pattern of playing. N joins A in the music by clapping in a quarter-note rhythm and creating upper body movements in synchrony with the clapping.	N follows A's lead in the music, waiting for A to explore the instrument before adding a new layer to the texture. N incorporates clapping from A's music in the previous experience and looks at A while smiling and moving his upper body to the music. N's support of A's independent music shows a desire to interact while also providing space for A to explore on his own.
Measures 11-16 A walks toward N with the shakers, and N reaches out his hands to receive them. N attempts to provide hand-over-hand assistance	A seems to be initiating an interaction with N at this moment, and N nonverbally supports A with open arms and hands. A focuses his eye gaze on N as he plays to assess N's playing before shifting focus to another area of the

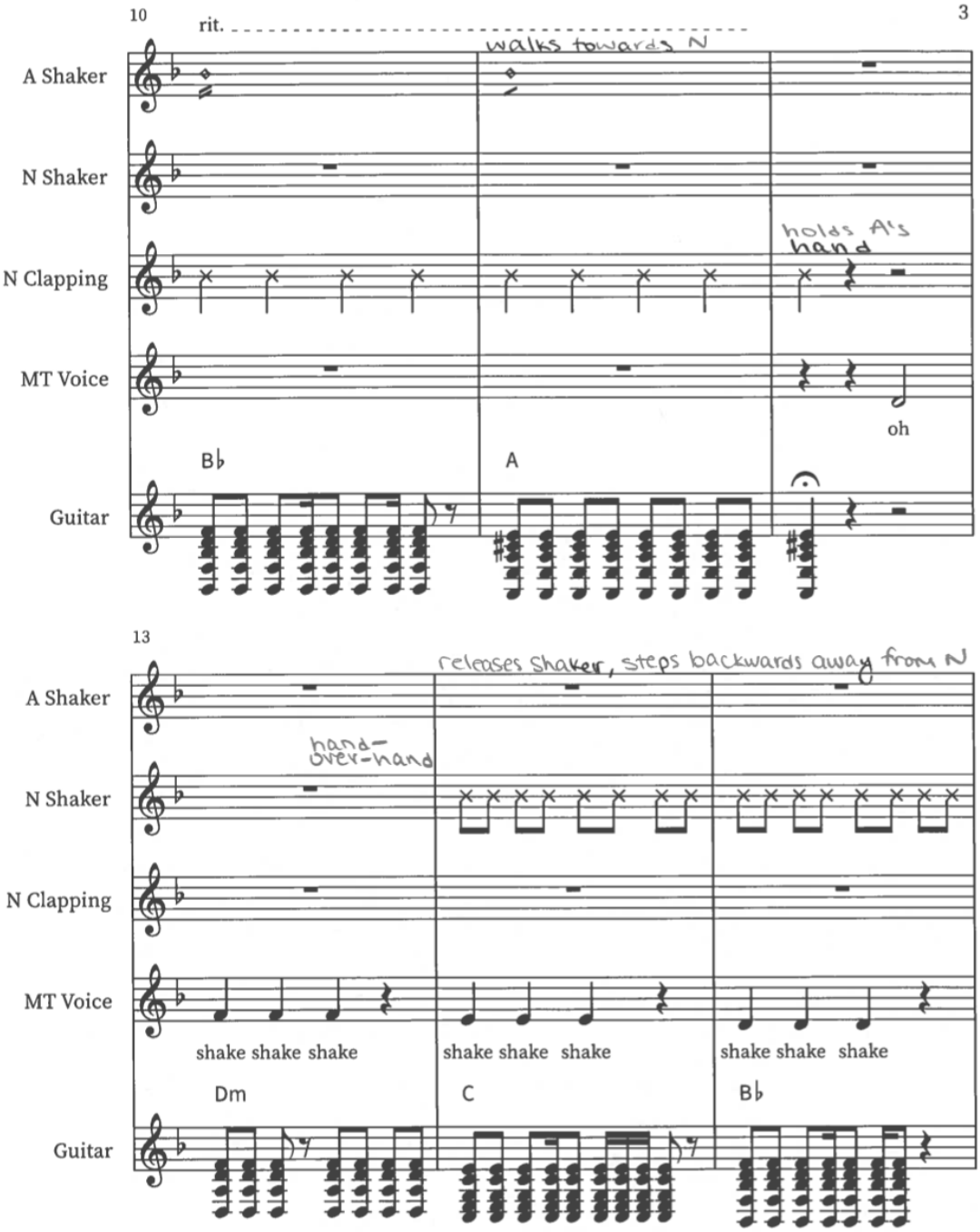
to A in playing the shakers, and A responds by releasing his grasp on the shakers and allowing N to hold them independently before walking to the opposite side of the room.	room.
Measure 17-22 MT verbally mentions to N that the shakers can split into two parts to be shared. During this time, A is walking the length of the room, with his eye gaze focused on N throughout. Once N splits the shakers and offers one to A, A immediately walks toward N and accepts the instrument. N provides hand-over-hand assistance to A for two beats before A moves away from N to independently play a faster rhythmic pattern, while N continues with an eighth note pattern.	A is seeking interaction with N through eye contact and instrument exploration. When N gives A an opportunity for connection by handing him a shaker, A immediately accepts it. A then allows N to engage in physical interaction with him through the instrument, before choosing to move away from N to continue engaging in the music in his unique way, developing his own identity in the music.
Measure 34-38 A shakes the shaker in a sixteenth-note rhythm similar to MT's strumming pattern in the guitar accompaniment. N tosses the shaker from one hand to another, catching A's attention. A focuses on N and pauses his shaking. N tosses the shaker again, and A begins shaking again. As N tosses the shaker for the fifth time, A passes his own shaker from one hand to the other, almost in synchrony with N's tossing.	A is internalizing N's idea with the shaker and mirroring this in his own way of playing. A is engaging both with MT through rhythmic mirroring of her strumming rhythm, and with his sibling through a similar movement of the shaker from one hand to another.
Measures 40-42 A focuses his gaze toward N, while N glances at MT and then at A. A smiles while gazing toward N, and N smiles at A.	This nonverbal communication shows the connection among all three individuals musicing together. This is the first time in this session that all eye gaze is focused on a person in the room, demonstrating an added layer of visual connection within the musical connection.
Measures 53-60 MT stops playing the guitar after a sixteenth-note forte pattern, and A and N stop playing. MT creates an opportunity for call and	MT uses silence in the music to create a new experience for A and N, assessing their engagement by providing an opportunity for turn-taking through call and response. A

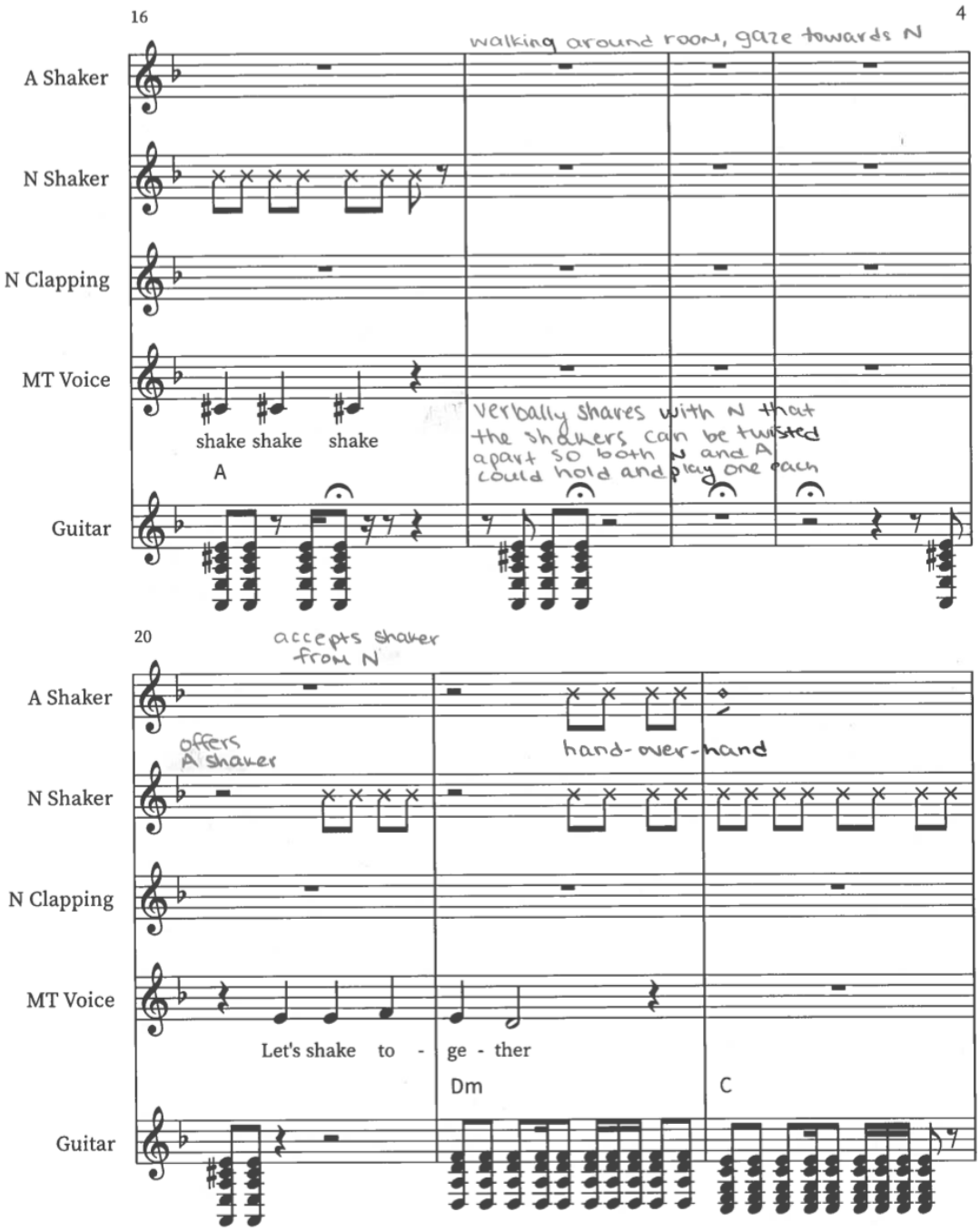
response in the music by singing the lyrics "shake shake shake" in the same rhythm as her guitar accompaniment and then leaving two and a half beats of silence. The first time MT does this, N shakes at the end of her phase, and A shakes in the beats of silence. A anticipates MT's playing; he stops and then resumes shaking one beat before the downbeat of the following phrase where MT plays the guitar again. By the last time through this phrase, A and N are playing with MT and stopping together.	seems to lead N to synchronize with MT, shaking his shaker a beat before MT as if to communicate to N to prepare to play again. Each time the phrase is played by MT, both A and N further synchronize to the pattern, and by the end of this B section in the music, A and N mostly start and stop playing in synchrony with MT.

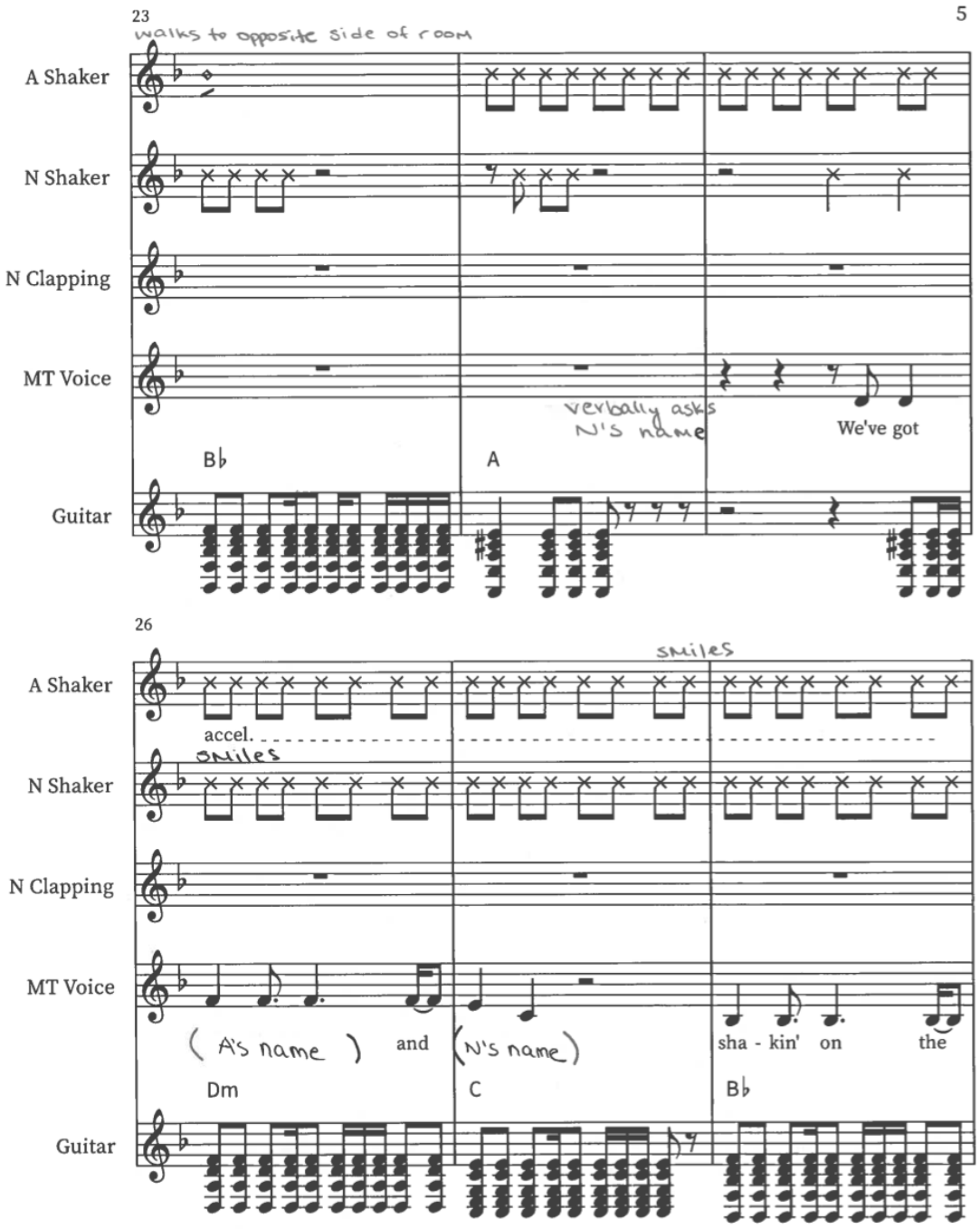
Figure 3.1: Music Manuscript for Shakers Experience

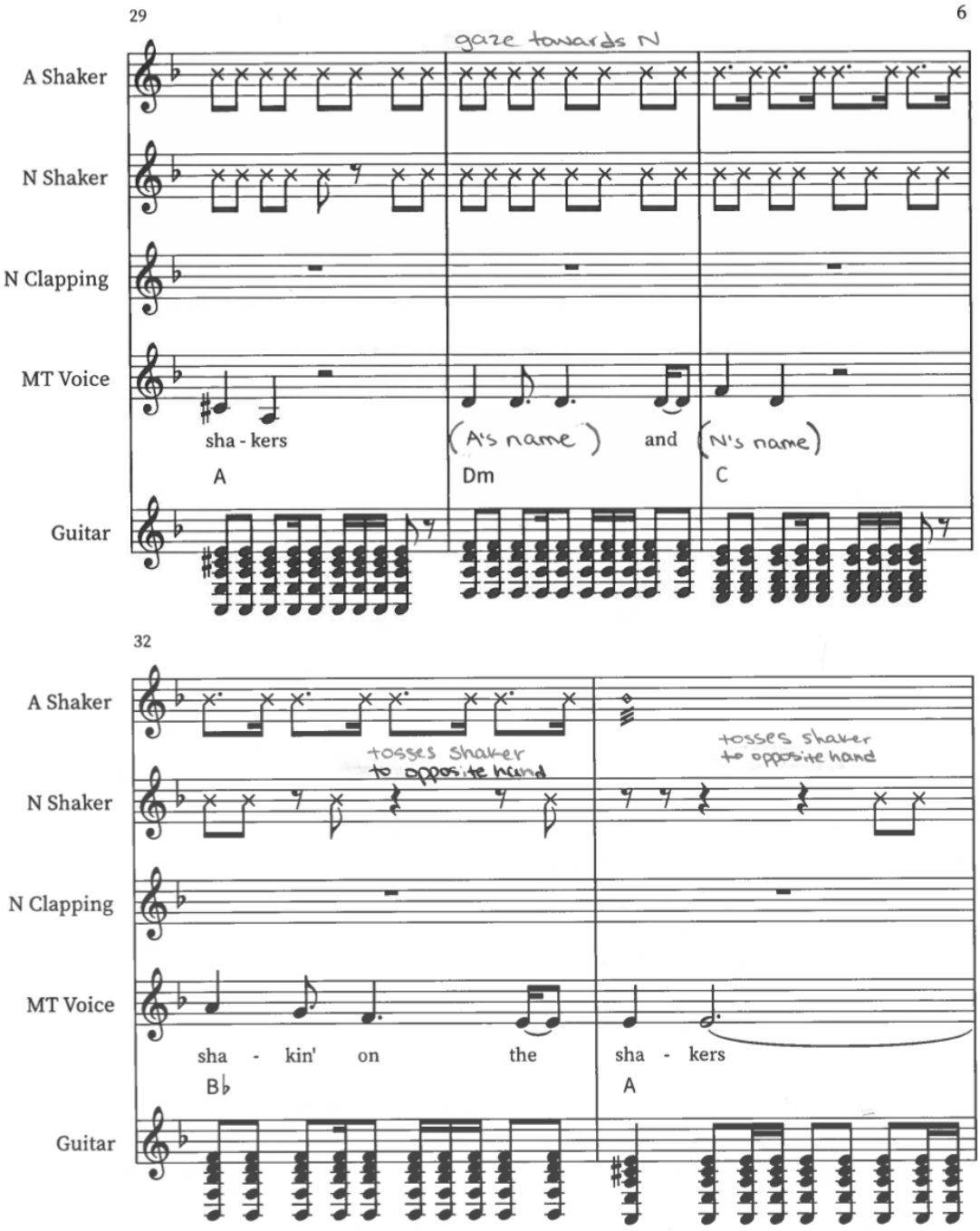


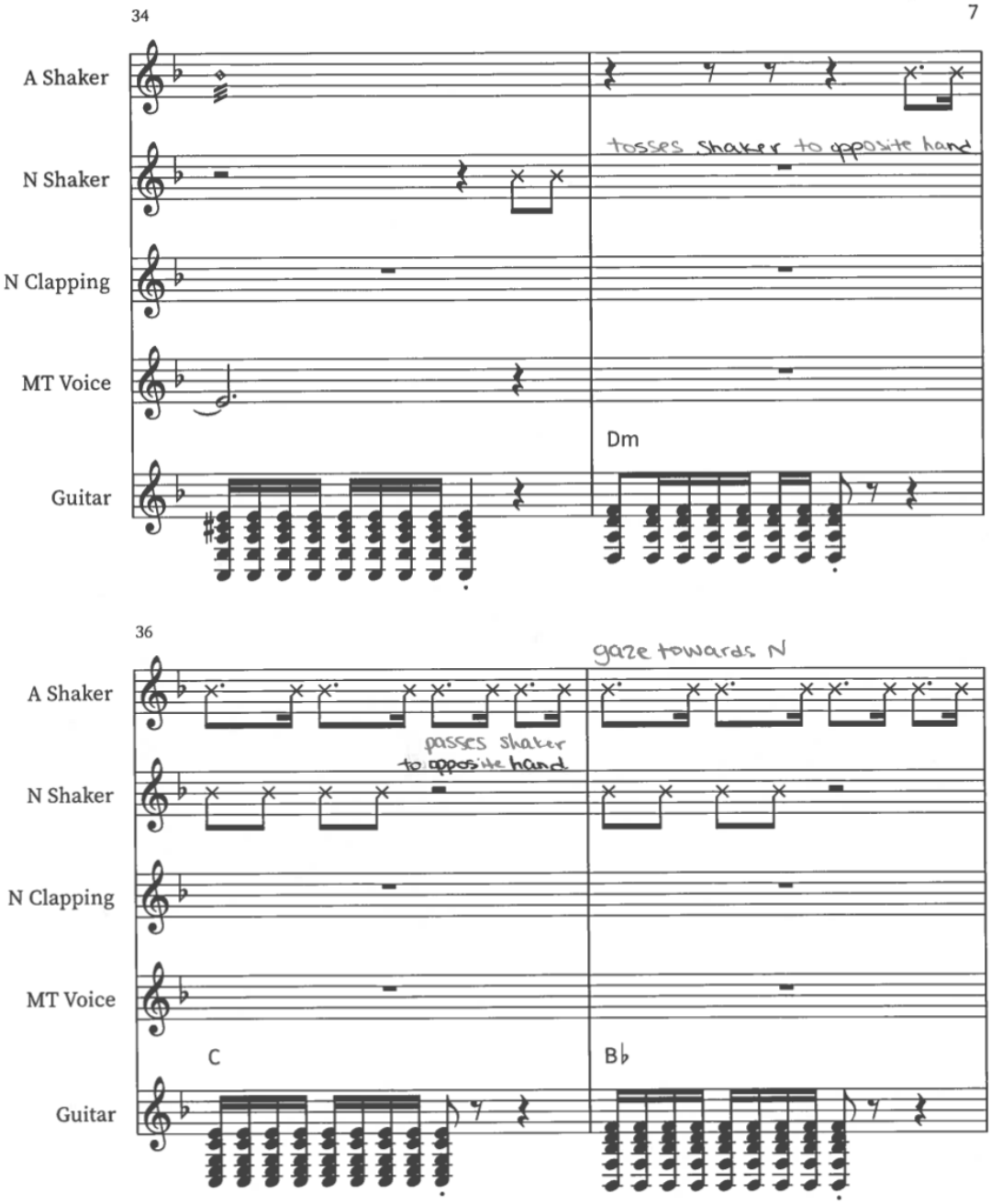

4
smile, walks to opposite side of room
accel.
2
shaker close to ear
A Shaker
N Shaker
body movement to music, smile towards A
glances to MT
N Clapping
MT Voice
Dm
C
B♭
Guitar
7
A Shaker
N Shaker
gaze towards A
N Clapping
MT Voice
A
Dm
C
Guitar

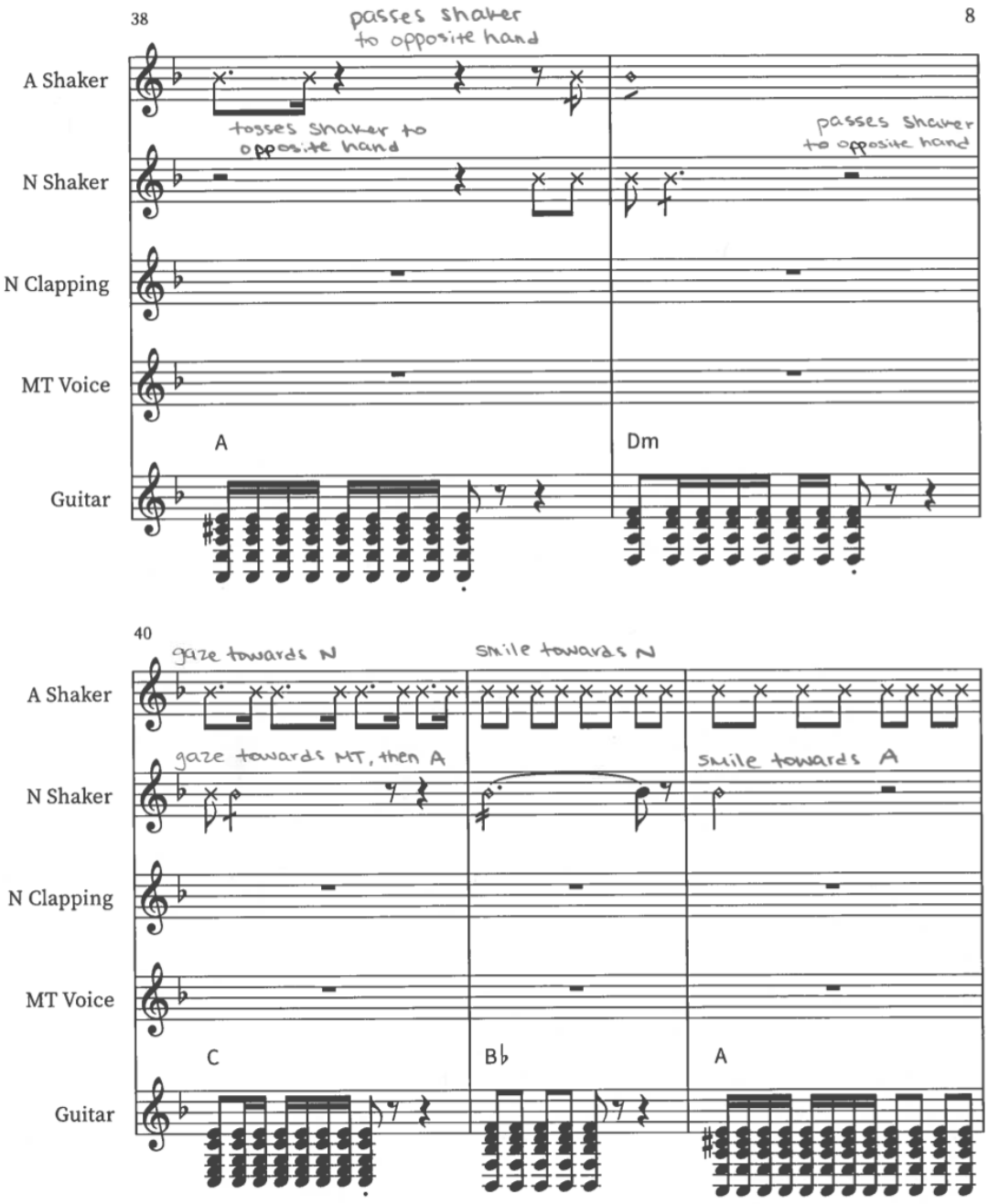

10
rit.
3
walks towards N
A Shaker
N Shaker
holds A's hand
N Clapping
MT Voice
oh
B♭
A
Guitar
13
releases shaker, steps backwards away from N
A Shaker
hand-over-hand
N Shaker
N Clapping
MT Voice
shake shake shake
shake shake shake
shake shake shake
Dm
C
B♭
Guitar

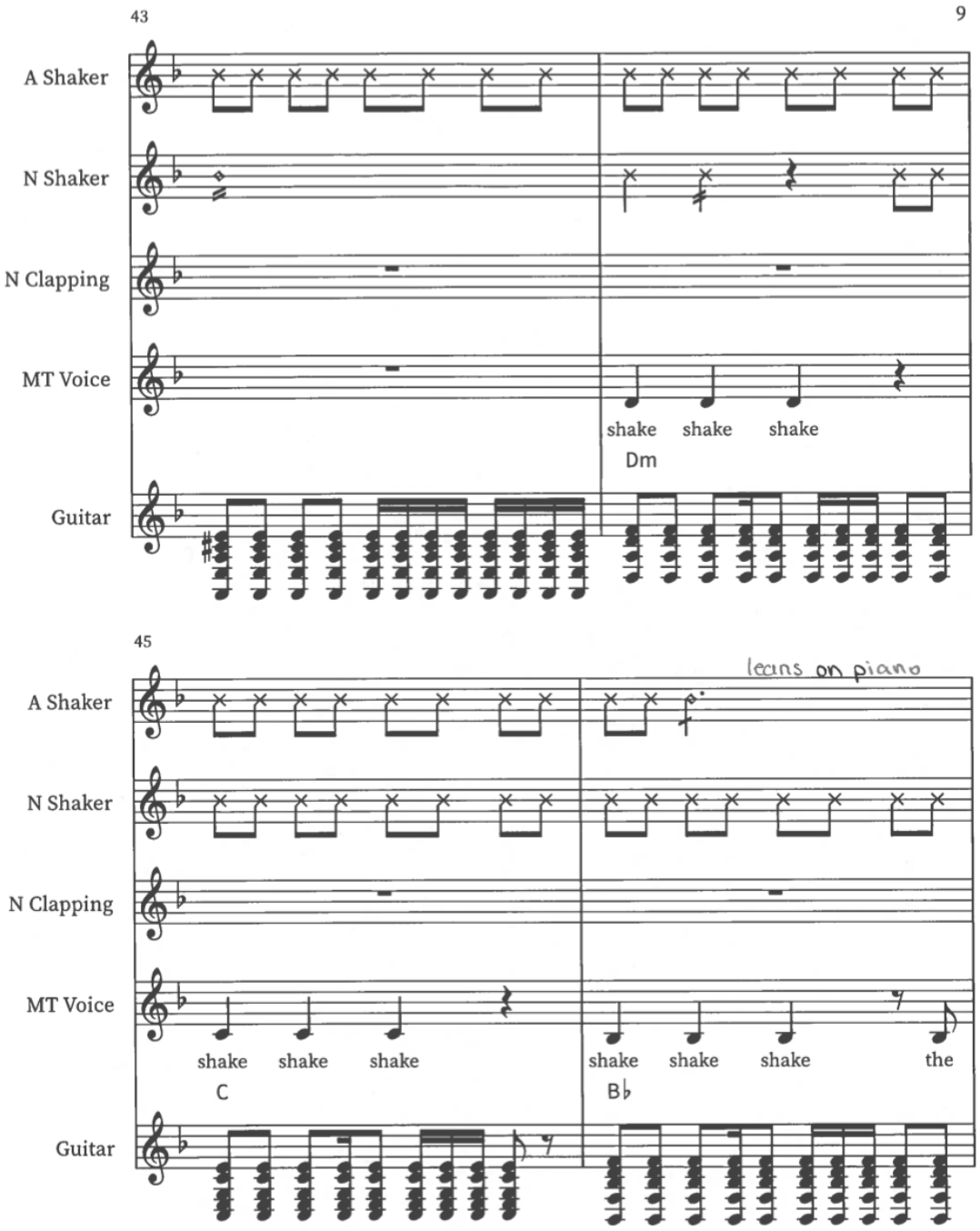

16
4
walking around room, gaze towards N
A Shaker
N Shaker
N Clapping
MT Voice
Guitar
shake shake shake
A
verbally shares with N that the shakers can be twisted apart so both N and A could hold and play one each
20
accepts shaker from N
offers A shaker
hand-over-hand
Let's shake to - ge - ther
Dm
C

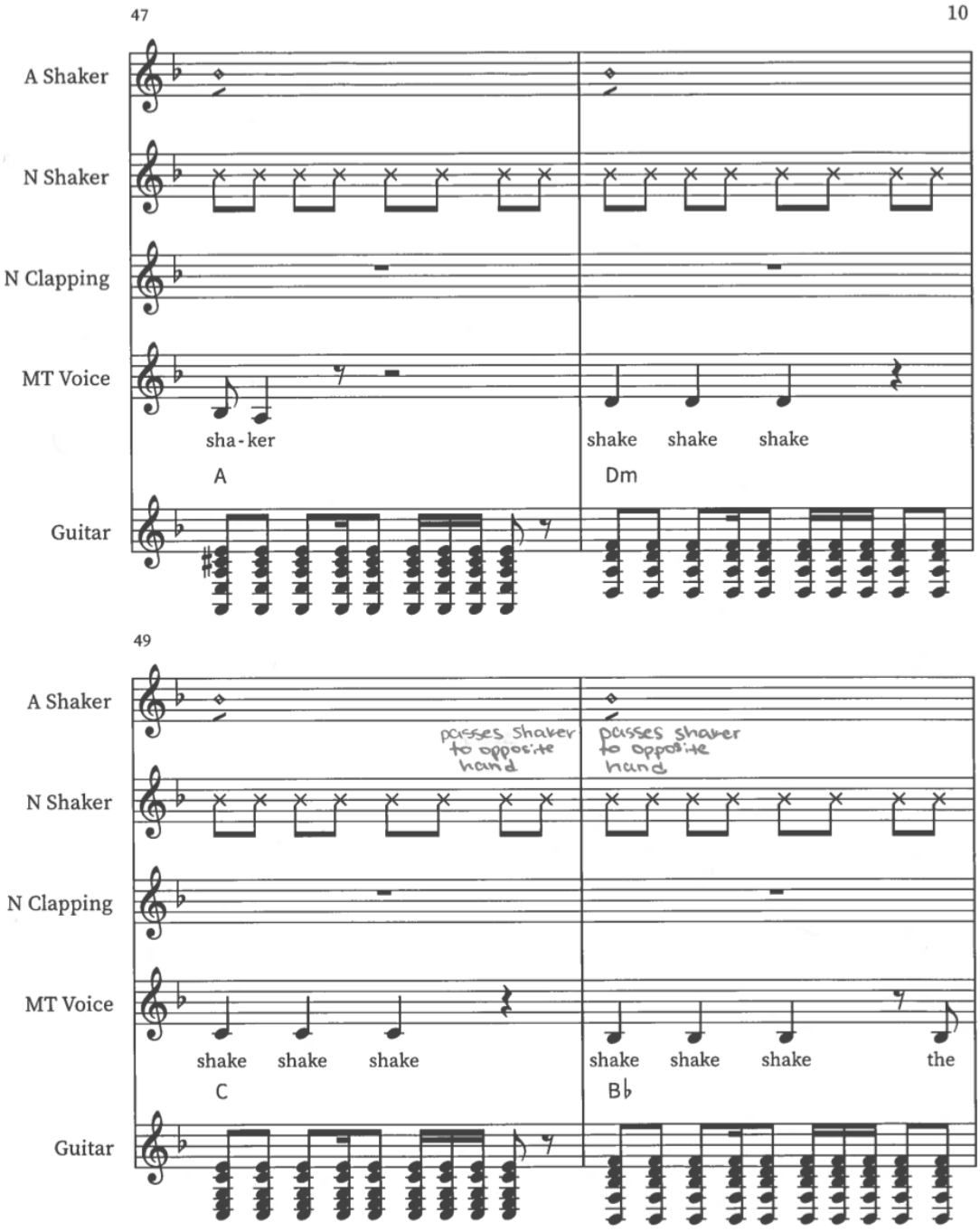

23
5
walks to opposite side of room
A Shaker
N Shaker
N Clapping
MT Voice
Guitar
verbally asks N's name
We've got
B♭
A
26
smiles
accel.
smiles
(A's name)
and
(N's name)
sha - kin' on the
Dm
C
B♭

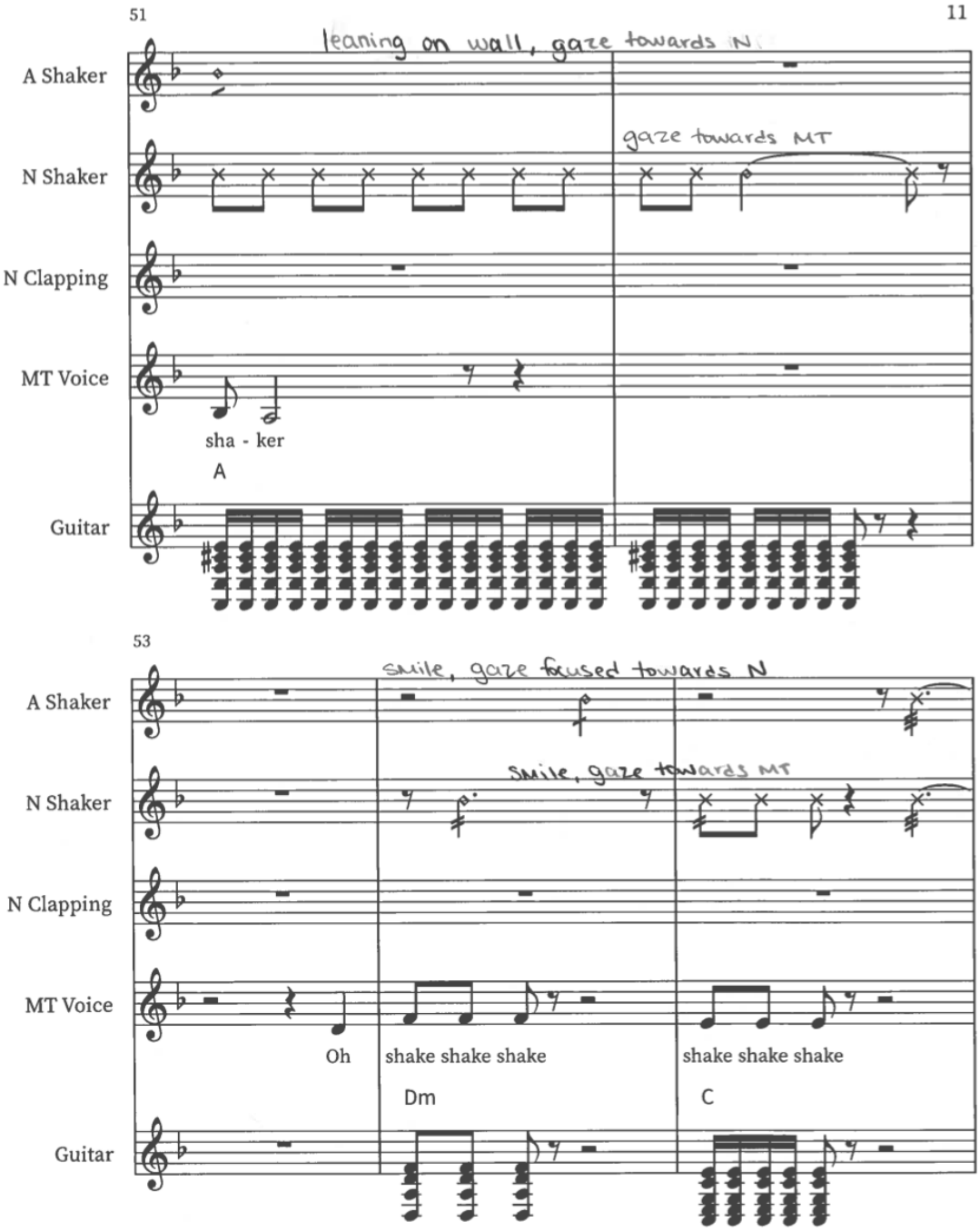

29
6
gaze towards N
A Shaker
N Shaker
N Clapping
MT Voice
sha - kers
A
(A's name)
and
(N's name)
Dm
C
Guitar
32
A Shaker
tosses shaker to opposite hand
tosses shaker to opposite hand
N Shaker
N Clapping
MT Voice
sha - kin' on the
sha - kers
B♭
A
Guitar

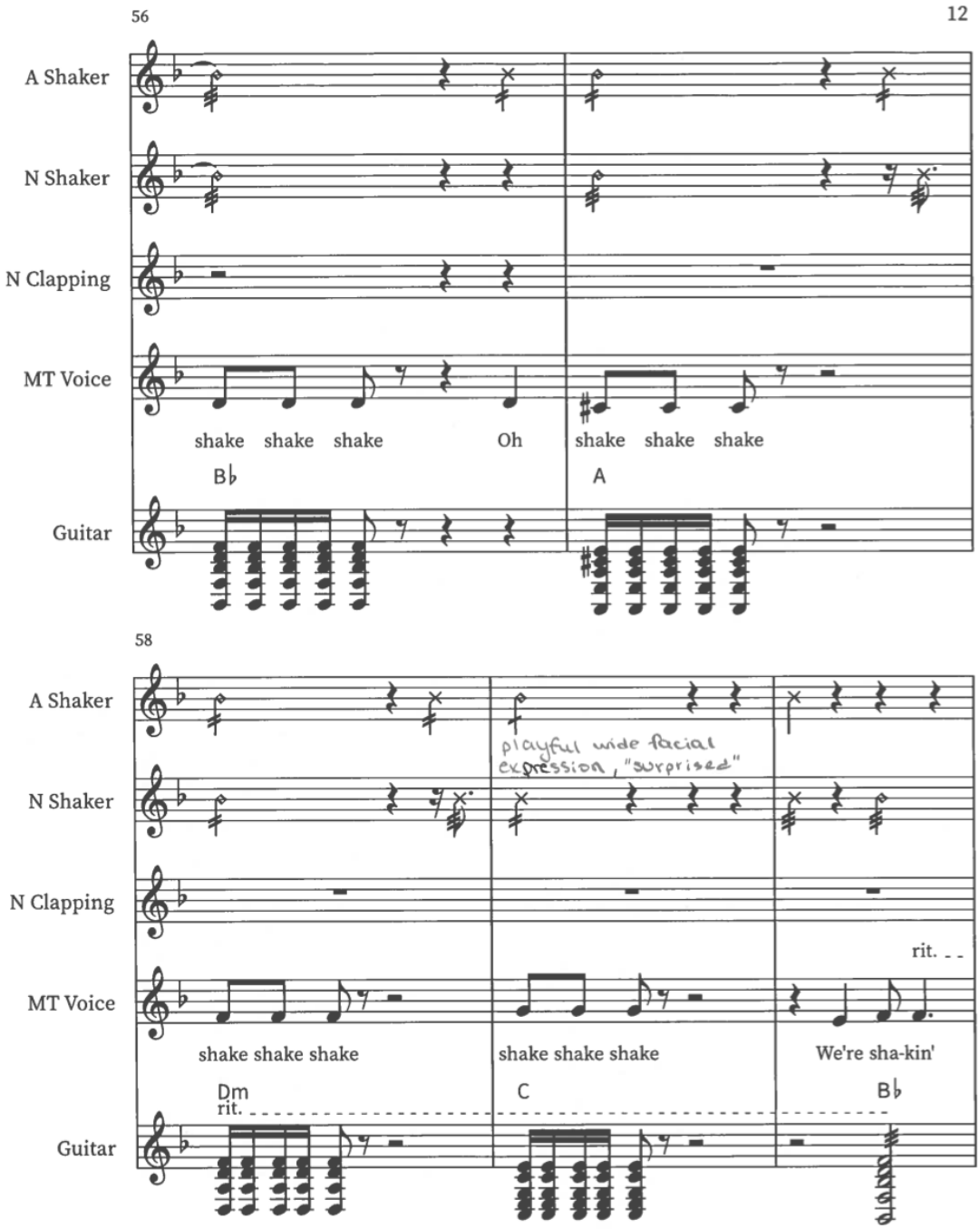

34
7
A Shaker
N Shaker
N Clapping
MT Voice
Guitar
tosses shaker to opposite hand
Dm
36
A Shaker
N Shaker
N Clapping
MT Voice
Guitar
gaze towards N
passes shaker to opposite hand
C
B♭

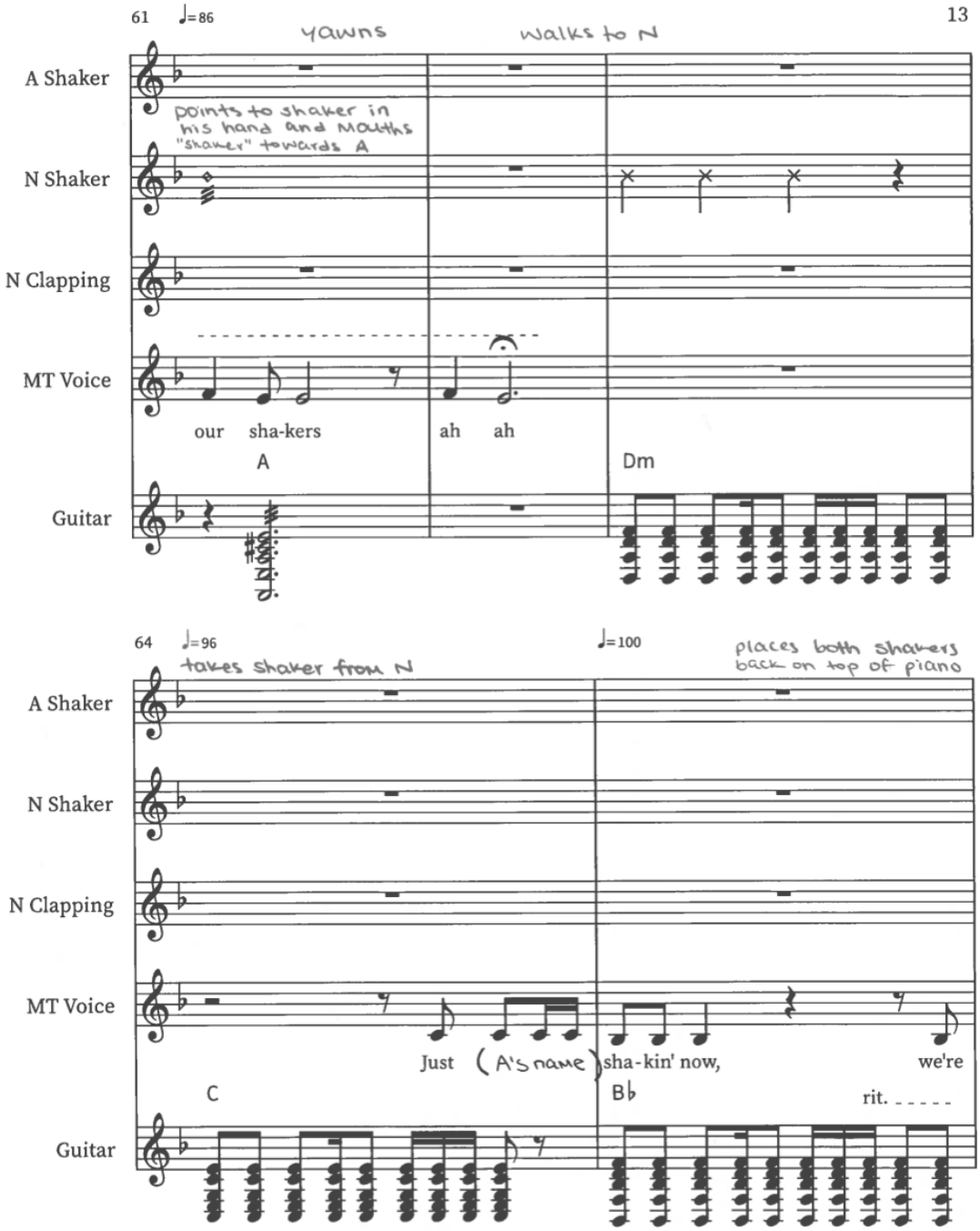

38
passes shaker to opposite hand
8
A Shaker
tosses shaker to opposite hand
passes shaker to opposite hand
N Shaker
N Clapping
MT Voice
A
Dm
Guitar
40
gaze towards N
smile towards N
A Shaker
gaze towards MT, then A
smile towards A
N Shaker
N Clapping
MT Voice
C
B♭
A
Guitar

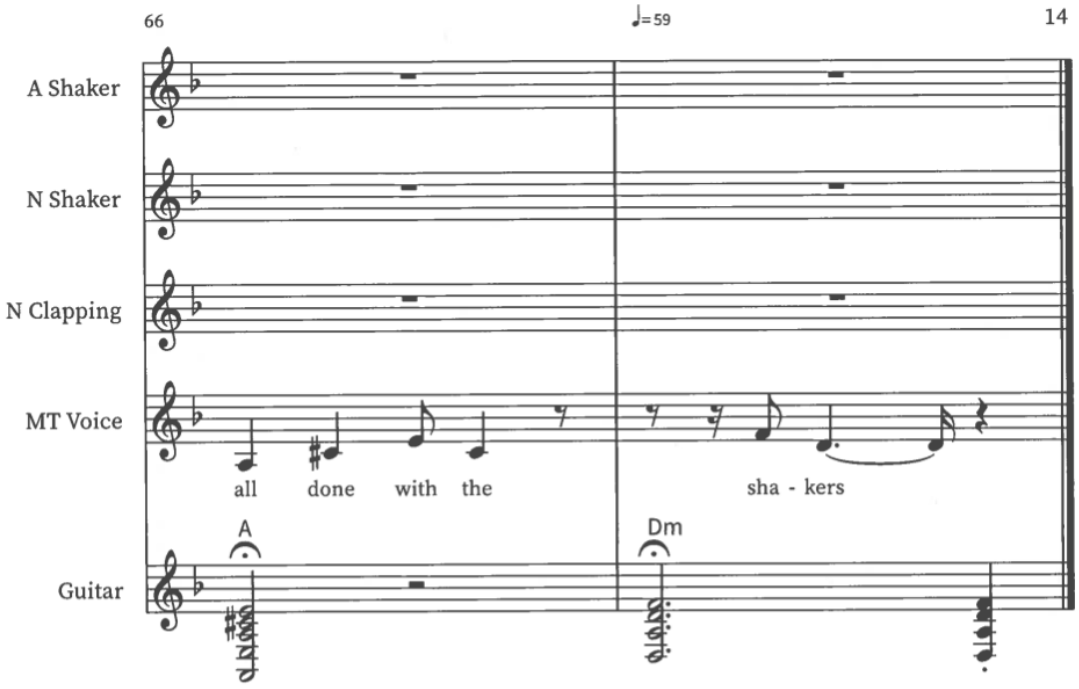

43
9
A Shaker
N Shaker
N Clapping
MT Voice
shake shake shake
Dm
Guitar
45
leans on piano
A Shaker
N Shaker
N Clapping
MT Voice
shake shake shake
C
shake shake shake the
B♭
Guitar


47
10
A Shaker
N Shaker
N Clapping
MT Voice
sha-ker
shake shake shake
A
Dm
Guitar
49
A Shaker
passes shaker to opposite hand
passes shaker to opposite hand
N Shaker
N Clapping
MT Voice
shake shake shake
shake shake shake the
C
B♭
Guitar


51
11
leaning on wall, gaze towards N
A Shaker
gaze towards MT
N Shaker
N Clapping
MT Voice
sha - ker
A
Guitar
53
smile, gaze focused towards N
A Shaker
smile, gaze towards MT
N Shaker
N Clapping
MT Voice
Oh
shake shake shake
shake shake shake
Dm
C
Guitar


56
12
A Shaker
N Shaker
N Clapping
MT Voice
shake shake shake
Oh
shake shake shake
B♭
A
Guitar
58
A Shaker
N Shaker
N Clapping
MT Voice
Guitar
playful wide facial expression, "surprised"
rit. - -
shake shake shake
shake shake shake
We're sha-kin'
Dm
rit.
C
B♭


61
♩=86
13
yawns
walks to N
A Shaker
points to shaker in his hand and Mouths "shaker" towards A
N Shaker
N Clapping
MT Voice
our sha-kers
ah ah
A
Dm
Guitar
64
♩=96
takes shaker from N
♩=100
places both shakers back on top of piano
A Shaker
N Shaker
N Clapping
MT Voice
Just (A's name) sha-kin' now, we're
C
B♭
rit.
Guitar


66
♩=59
14
A Shaker
N Shaker
N Clapping
MT Voice
all done with the
sha - kers
Guitar
A
Dm

Themes and Subthemes

Based on the microanalysis of each music excerpt and thematic analysis across all three client-initiated experiences, the following findings are presented below.

	Themes	**Subthemes**	**Descriptions and Examples**
1	Fields of Trust		Trust and shared understanding manifested within existing and newly established relationships in the session.
		Existing and Continually Developing Relationships (A and N, A and MT)	- Initiation of the accordion experience: A offers N the instrument. - Initiation of the wind chimes and joint clapping experience: N points to the instrument. - Measures 11-16 in the shaker experience: N accepts A's instrument offering.
		Newly Established Relationships (N and MT; A, N, and MT)	- Measures 34-38 in the shakers experience: N playfully tosses shaker. - Measures 40-42 in the shakers experience: call and response amongst MT, N, and A. - Increased length of all experiences throughout session duration.
2	Communication Beyond Words		The exchange of thoughts and ideas through nonverbal and musical experiences.
		Communication Through Physical and Gestural Cueing	- Initiation of the accordion experience: A hands N the instrument. - Initiation of the wind chimes and joint clapping experience: N points to the instrument. - Measure 3 in the wind chimes and joint clapping experience: N provides hand-over-hand assistance to A. - Measures 7-10 in the wind chimes and joint clapping experience: N provides hand-over-hand assistance to A to stop adjusting his clothing. - Measures 16-18 in the wind chimes

			and joint clapping experience: N creates joint hand clapping movement with A's hands. - Measures 39-42 in the wind chimes and joint clapping experience: N points to chimes and models playing. - Initiation of shakers experience: A hands N the instrument.
		Communication Through Eye Gaze	- Initiation of the accordion experience: N's eye gaze toward MT, then lack of eye gaze toward MT. - Measures 20-22 in the wind chimes and joint clapping experience: N's eye gaze toward MT, and A's eye gaze toward A's and N's hands around the instrument. - Measures 11-16 in the shakers experience: A's eye gaze at N's hands around the instrument. - Measures 17-22 in the shakers experience: A's eye gaze toward N even while in motion. - Measures 40-42 in the shakers experience: 3-way eye gaze
		Attunement and Mirroring Through Musical Communication	- Measure 8 in the accordion experience: A's mirroring of N's button pressing - Measure 12 of the accordion experience: accelerando in sibling accordion playing. - Measure 21 of the accordion experience: MT adjusts to siblings' playing. - Measure 22 in the wind chimes and joint clapping experience: A's similar yet unique hand movements with N's hands. - Measures 34-35 in the wind chimes and joint clapping experience: MT notices a shift in the siblings and adjusts music to reengage them. - Measure 43 in the wind chimes and joint clapping experience: MT sways to mirror A's movements. - Measures 34-38 in the shaker

			experience: A has internalized N's movements and MT's accompaniment. - Measures 53-60 in the shaker experience: A internalizes turn-taking.
3	Independence Within Interdependence		- Measure 8 in the accordion experience: A's independent playing after N initiated playing. - Measure 3 in the wind chimes and joint clapping experience: N providing space for A to explore. - Measures 7-10 in the wind chimes and joint clapping experience: N redirects A in stages. - Measures 11-16 in the shakers experience: A explores independently before offering an instrument to N. - Measures 17-22 in the shakers experience: A waiting for N's initiated idea, and N waiting for MT's guidance. - Measures 53-60 in the shakers experience: MT encourages call and response, and N and A engage uniquely.

Theme #1: Fields of Trust

A, N, and MT demonstrated different levels of trust in one another, impacting each intervention and the trajectory of the session as a whole. The previously established relationship between MT and A had begun two weeks before this session, making this session the third time the two are musicing together, though A had received music therapy services previously with another music therapist. During the session, existing trust appeared to develop further in the relationships between A and MT, and between A and N; and newly established trust appeared to emerge in the relationships between N and MT, as well as among N, MT, and A.

Subtheme #1: Existing and Continually Developing Relationships.

Existing and continually developing trust is evident in the relationships between A and MT, and between A and N, in all of the experiences analyzed.

Though there has been little time for a relationship to form, the trust that has been established between A and MT is reflected in A's freedom to interact with instruments in his own time. In both the accordion experience and the shakers experience, A freely chooses to interact with instruments strategically placed by MT on top of the piano. A is aware of the opportunities to play instruments and demonstrates trust that he can do so when he is ready. A also shows N that there is trust between himself and MT by offering N an instrument, demonstrating that it is encouraged and celebrated in this space to explore musical activity. A invites N to be a part of that, evidently trusting that MT will provide them with musical support in that exploration, based upon the relationship they have established in the prior two sessions. A's trust could also be rooted in the music itself, trusting that his relationship to his past experiences in music allows for free exploration. Because A has participated in music therapy over an extended period of time, it is possible that his understanding of the elements of music that he has developed over time, in combination with MT's reflection of his music and demonstration of support, allows for A to feel free in his exploration.

The established relationship between A and N is deeply rooted in their experiences as siblings outside of the music space, developing over the course of their 14 years together. An example of their longstanding relationship as a field of trust is A's initiation of the accordion experience through his actions of bringing the accordion to N. A's comfortability and trust that N will accept this offering, followed by A's release for N to explore ways of engaging with the instrument, demonstrates A and N's mutual understanding of interaction with one another

outside of music and their generalization of this understanding within the new music therapy setting. This dynamic is also present in measures 11-16 in the shakers experience, when A walks toward N with the shakers and N reaches toward him with open arms. Similarly, in initiating the wind chimes and joint clapping experience, N points to the wind chimes and plays the lower tones, and A joins N immediately. Though A does not initially play independently, N trusts A to join him in an offered activity without the need for verbal or physical assistance. This attests to their mutual and instinctive trust, their practiced ways of interaction in their daily lives, and their confidence that their known bond will carry over into unknown experiences together.

Subtheme #2: Newly Established Relationships.

Along with pre-established trust, new trust emerges throughout the session. The newest relationship in this session was between MT and N. MT and N's previous interactions included brief greetings and goodbyes in the waiting room before and after A's sessions. The novelty of N joining A's session in this instance was unexpected for both MT and A.

Through N's initiation of ideas and redirection of A's actions throughout the session, it was clear that N has an automatic response to being in the caretaker role. For the duration of the wind chimes and joint clapping experience, N takes on this role on multiple occasions, guiding A to stop adjusting his clothing, pointing to the wind chimes to encourage A to participate in the music, and facilitating the movements of their hands to start the joint clapping section of the improvisation. From these small moments alone, it is likely that N is moving into a familiar role as a caretaker. N briefly looked to MT at least once in each experience, and each time, MT provided minimal feedback to N and only verbally interjected to ask N's name to be included in improvised lyrics and to briefly explain the functionality of an instrument. This lack of direction within a structured music framework allowed N to take on a new role and explore his own

capacities within improvisation. It appeared that N's ability to trust the music therapist to care for both himself and A allowed him to be spontaneous with A and acted as a creative release for him. In measures 34-38 of the shakers experience, N tosses a shaker from one hand to another, engaging in an openly playful way. While doing so, N does look to MT or A but appears to innately enjoy his own creativity and spontaneity in that given moment.

Another area of trust that emerged was in the newly established relationship between MT and the siblings as a dyad. In measures 40-42 of the shakers experience, A looks to N while N looks to MT, and MT looks back to N. This is the first moment that everyone in the room is interacting visually with one another, and MT capitalizes on this moment by formulating a call-and-response intervention. In these moments, joint referral is evident, with N showing his trust in MT by simply looking in her direction for guidance, and MT showing trust in both N and A that they are ready for even further collaboration in the musical space.

An indicator of the growing trust among all three individuals was the duration of these initiated music experiences in relation to the time within the session. Music interactions lasted longer as the session continued, with the first experience lasting one minute and eight seconds, the second lasting two minutes and forty-six seconds, and the third lasting two minutes and thirty-one seconds. Both A and N appeared to trust the music as a container for their creativity, knowing the music structure would remain present so they could comfortably explore and collaborate. This ultimately solidified the trust between A and MT and reinforced the trust that was developing for the first time between N and MT.

Theme #2: Communication Beyond Words

Communication among A, N, and MT in the session consisted largely of musical communication and nonverbal communication, specifically physical and gestural cues. Both

types of communication reflected dynamics of interpersonal connection such as attunement and mirroring. These dynamics highlighted the cycle of influence between nonverbal and musical communication, revealing the ways that nonverbal communication influenced and created space for musical communication, and vice versa.

Subtheme #1: Communication Through Physical and Gestural Cueing.

Physical and gestural cueing between N and A was a significant aspect of communication and connection between the siblings. Each analyzed music experience was initiated through nonverbal communication by either N or A, allowing an improvised experience to unfold. To start the accordion experience, A brings the instrument to N to initiate an interaction, and N responds by joining and holding the instrument with A. Prior to the wind chimes and joint clapping experience, A was putting instruments away in the closet in the session room. When N points to the wind chimes, A changes his course of action and joins N at the instrument. Initiating the shakers experience, A independently picks up the shakers, briefly plays on his own, and eventually brings the instruments to N. Each interaction is initiated through nonverbal gestures or cues that allow for a connection between the siblings, which in turn allows an improvised experience to take form with the help of MT's music accompaniment.

The siblings interact through gestural cues in measures 39-42 of the wind chimes and joint clapping experience. A disengages from the wind chimes and reaches for N's jacket on the chair nearby. N sits in front of the jacket, waits for A to move away, gestures toward the chimes, and models playing, shifting A's attention and reigniting his interest in the experience. Though subtle, A shows consistent quick responses and almost immediate reengagement when this form of gestural communication is employed by N.

Additionally, N often incorporates physical cueing through hand-over-hand assistance to engage A in music experiences. Given the trust and shared understanding between the siblings, N's brief physical assistance is effective as a means to connect and communicate. In measure 3 of the wind chimes and joint clapping experience, N initially provides a visual cue and modeling through positioning his body toward the wind chimes and playing them. When A does not respond, N physically supports A in playing by providing hand-over-hand assistance. As A's hand touches the instrument, N releases A's hand and A plays the instrument independently.

N incorporates the siblings' preexisting trust in physical touch as a way to interact with A more deeply, exploring new ways to be in the music together and prioritizing interaction and engagement. In measures 7-10 of the wind chimes and joint clapping experience, N initially allows an extended period of time for A to engage independently before providing hand-over-hand assistance to stop A's adjustment of his clothing. When A adjusts his clothing again shortly afterward in measures 16-18, N quickly stops A and attempts a new form of interaction to maintain A's engagement in the music. N and A's relationship and comfortability with physical touch is clear here, as N puts his hands below A's and moves them up and down to simulate joint clapping. Within one measure, measure 18, N releases A's hands, and the two create a clapping sound that is synchronized with MT's guitar accompaniment to create a new idea in the music. This short moment shows N's trust that A will continue to engage with him, through his prior knowledge of A's readiness for physical guidance and cueing. N also trusts A's need for time and space to explore independently, incorporating a variety of verbal and visual cues first before moving to physical interjections, all with the leading goal of sustaining A's engagement.

Subtheme #2: Communication Through Eye Gaze.

Eye gaze was found to be another form of nonverbal communication that allowed for further connection among all three individuals in the sessions. N often shifted his eye gaze to MT, which appeared to seek confirmation that what was happening was deemed acceptable by MT. When N checked in with MT, MT often responded by limiting eye contact and verbal responses, while continuing the music accompaniment. At the start of the accordion experience, MT provides brief verbal instructions on how to open the buttons at the side of the instrument. N smiles toward MT and shows he is readily available to connect more fully with A in the experience, continuously playing the instrument with A in measures 8 and 12 and avoiding eye gaze toward MT. In measures 20-22 of the wind chimes and joint clapping experience, N's gaze is focused on MT and A's gaze is focused on his and N's hands. The direction of gaze shows where each person's attention is focused, with N seeking guidance from MT and A focusing on the possibilities of the next stage of the music experience. Each individual's focus shows their connection to the music and the people involved, ultimately grounding each person to move forward into what unfolds as a spontaneous musical interaction.

A's most frequent mode of communication is nonverbal, so it is essential to note his eye gaze within music experiences in order to understand his interests and focus. In measures 11-16 in the shakers experience, A provides N with the shakers and focuses his eye gaze on N's manipulation of the instrument before turning his eye gaze and body to another area of the room. As MT and N exchange brief verbal communication about the instrument within measures 17-22 of the same experience, A paces the opposite end of the room, with eye gaze continuously focused on N and the shakers in his hands. When N splits the shakers and reaches out to A, A

immediately walks over to N, suggesting that his intentional eye gaze reflects excitement for engagement and interaction with the instrument.

In measures 40-42 of the shakers experience, N's eye gaze is focused toward MT and A's eye gaze is focused toward N. As MT continues to provide accompaniment, N's gaze shifts to A, A smiles, and N smiles back. The experience unfolds into a call and response, where N and A are engaging as a dyad together while MT maintains a different part in the music and leaves spaces for N and A's response. MT's deliberate absence of verbal direction while continuing the music accompaniment appears to encourage a check-in between the siblings. That check-in develops into a spontaneous improvised experience while also providing N with the impetus to immerse himself in the unknown of musical exploration.

Subtheme #3: Attunement and Mirroring Through Musical Communication.

Moments of attunement and mirroring were demonstrated by the participants through shared attention and response to each other, wordlessly imitating or matching one another's actions or expressions (Guerrero & Turry, 2012). Attunement and mirroring are dynamics of interpersonal connection and interaction present in shared music-making, along with interactions outside of music. An example occurs in measure 8 and measure 12 of the accordion experience, where N and A create harmony and an accelerando in their playing together. Additionally, in measure 8 of the accordion experience, A notices N pressing buttons on the accordion to create different melodic lines and mirrors N's button pressing to create harmony. Though the melodies each sibling plays is different, their playing mirrors each other in the creation of sound and, ultimately, in the notes they individually choose to complement each other and form composite melodies in their joint playing. In exploring the instrument, N and A create harmony in their playing by pressing different buttons simultaneously. This continues for four measures, and then

in measure 12, an accelerando begins, which appears to express excitement. While playing the same instrument simultaneously, N and A respond to each other by incorporating button pressing into their playing, each one choosing different buttons to add their own unique expression. Their clear recognition and enjoyment of this dynamic is evidenced by their quickened and excited playing.

In measure 21 of the accordion experience, MT notices a shift in A and N's hands to adjust their held instrument, and MT attunes to them by responding with longer rhythmic ideas to maintain continuity in the music during their adjustments. In measure 43 of the wind chimes and joint clapping experience, MT attunes to A as he moves his body to the left and right while playing the chimes. MT responds to his evident need for movement at this moment by adding texture to the music, improvising a vocal melody line and increasing the dynamics of the accompaniment. MT also sways her body to synchronize with A's movements and musical ideas more fully. Similarly, in measure 22 of the wind chimes and joint clapping experience, A has internalized an idea from N earlier in the experience and creates a similar yet unique movement. Earlier in the experience, N held A's hands and moved them up and down before releasing them to create the joint clapping movement and sound. In measure 22, A holds N's hands and creates a movement that relates to his previous movement, yet is new, alternating one set of their hands up and the other down. This response to N's original movement indicates an internalization of his idea, along with a desire to bring the idea back in a unique way that heightens their connection within the musical structure. To support this interaction, MT employs improvisational clinical techniques of incorporating, imitating, pacing, reflecting, and holding, which are classified by Bruscia as techniques of empathy and are "usually accomplished by nonverbally matching or mirroring what the client is doing" (Bruscia, 1987, p. 537). Such techniques allow for MT to

continue to create a space within which the siblings, along with herself, feel comfortable, seen, heard, and willing to explore.

MT also takes a moment to assess the siblings' engagement within the music experience. In measures 34-35 of the wind chimes and joint clapping experience, MT believes N and A to be disconnected from the experience, shown through A rubbing his eyes and N focusing on his hands. MT holds a chord within the progression, incorporating Bruscia's (1987) elicitation technique of making space to support and motivate the siblings. This did elicit a response in both N and A almost simultaneously, with both siblings turning toward the same instrument and playing again. This example demonstrates attunement among all three individuals, with MT noticing a shift initially, and then both siblings noticing a shift in the music and quickly rejoining to continue the forward movement of the music. In addition to the siblings' attunement to each other and MT, MT also attunes to the siblings, demonstrating the spontaneous nature of the improvisational experience and the constant shift that can and will occur within one music experience.

In measure 36 of the chimes and joint clapping experience, A plays the wind chimes from the lowest tone to the highest tone and, in measure 43, adds an element of upper body movement as he plays. Up to this point in the experience, A had only played from the highest tone to the lowest tone. Thus, this moment is significant in demonstrating A's internalization and reflection of N's playing from the lowest to the highest tone, and A's desire to explore playing in this way, while also adding his own personalized element of movement to make it unique. In measure 43 of the wind chimes and joint clapping experience, MT mirrors A's movements by swaying her own body in the same direction that A is moving. A responds with both his characteristic

descending playing and the ascending playing he has internalized from N, while continuing to incorporate his personalized movements. This shows mirroring among all group members.

In measures 34-38 of the shakers experience, MT plays a sixteenth-note rhythm in the guitar accompaniment, and N tosses his shakers back and forth between his hands. In A's shaking, he incorporates rhythmic elements of MT's guitar accompaniment, and he switches the shaker from one hand to the other in synchrony with N's hand switch. Thus, A demonstrates mirroring of both MT's and N's ideas. In addition, A also demonstrates his individualized innate understanding of the musical structure and uses it as a means of attunement to both N and MT. This brief moment shows A's recognition of what is happening in the space and both his desire and ability to alter his music to attune to the others, with what can be interpreted as the intent to build relationships and connect. Additionally, in measures 53-60 of the same experience, A is almost immediately attuned to MT's invitation to call-and-response by leaving space in her music for a response. While N shakes with MT's singing and playing, A shakes in the silences, internalizing the idea of turn-taking almost instinctively, before again altering his music to play in synchrony with N and MT.

Theme #3: Independence Within Interdependence

Aspects of autonomy and leadership came into play throughout the music experiences, unfolding right from the start of the session and continuing to develop across all three individuals.

Initiation of each experience unfolds with A and N alternating leadership roles, showing the different areas of their independence as individuals and their interdependence with each other. Opening the accordion experience, A takes the leadership role first by bringing the accordion to N independently. N takes the leadership role next in the wind chimes and joint

clapping experience, pointing to the wind chimes and standing at the instrument to encourage A to play. In measure 3 of this experience, N's visual modeling does not elicit a new response from A, so only then does N briefly hold A's hand to bring it toward the instrument before releasing it so A can explore. In the shakers experience, A starts playing the instrument first, exploring it on his own by bringing it closer to his ear and walking the length of the session room before bringing the instrument to N in measures 11-16 to initiate an interaction.

N demonstrates a clear understanding of how and when to initiate a physical connection with A in a way that allows for A's autonomy to be expressed while also prioritizing the maintenance of his engagement. Thus, A's independence develops in the context of his interdependence with N. In measures 7-10 of the wind chimes and joint clapping experience, N verbally encourages A to stop adjusting his clothing and then moves to hand-over-hand assistance to bring A's hand back to the chimes to reengage in the music. N offers scaffolded guidance to continue to give A the opportunity to partake on his own before interjecting more intensely. In measure 8 of the accordion experience, A mirrors N's button pressing on the accordion with evident desire to engage and create harmony, showing that A is capable of independent playing and exploring, though he is dependent on N's initiation of playing. N also shows dependency on A here, only continuing the experience with A's deliberate button pressing. Though N is leading, the continuation of their experience is influenced by the two siblings playing simultaneously, as well as MT continuing to play her instrument to create a holding environment for their exploration. This interdependence among all three is shown through the fact that any change in their participation will bring about a change in some aspect of the music. This is also evident in measures 17-22 of the shakers experience, where N splits the shakers and hands one to A, which A quickly accepts. A shows dependency on N to formulate an

idea, N shows dependency on A to develop the idea once provided the opportunity, and N and A show dependency on MT to offer guidance through musical structure and rhythmic interest, along with necessary nonverbal or verbal cueing to provide comfortability and validation to explore.

Even with N's comfort and practice in initiating and facilitating with A in daily life outside the session, N often looks to the adult in the room, MT, for guidance. In response to N's frequent visual check-ins, MT creates space for leadership to shift and for exploration to occur. Even with N's consistent initiation and guidance toward A, A has the unique opportunity to be a leader in music experiences. In a sibling dyad, it is possible that the older sibling guides the younger sibling due to more years of experience in the world. In N's actions, consistent verbal and nonverbal attempts to facilitate and lead, and A's relaxed trust toward N in all interactions, it is clear that N, despite being the younger sibling, is used to this leadership role and his prioritization of A's engagement in life outside of music. With A being more experienced in the music therapy space and N having less music experience in this way, by contrast, A has an opportunity to be a leader and take on that older sibling role in the session. In measures 53-60 of the shakers experience, MT creates an opportunity for call and response in the music by singing the lyrics "shake shake shake" in synchrony with the guitar accompaniment and leaving silence for the siblings' responses. The first time this occurs, N shakes at the end of the phrase and A shakes in the beats of silence. A anticipates the return of MT's accompaniment and continues to start shaking before the downbeat of the following phrase. In this, A is showing N a way to be in the music, seeming to show N where to play next and preparing him by playing slightly earlier than when playing "should" occur. By the end of the experience, the siblings are playing in synchrony with MT, showing A's ability to lead in an area that he is more familiar with and can

provide more context for than N.

CHAPTER 5: DISCUSSION

This study aimed to explore the sibling relationship within improvisational music therapy, specifically the relationship between an autistic sibling and a neurotypical sibling, and their experiences during an improvisational music therapy session together. The themes and subthemes that emerged from the data shed light on the relationship between the siblings as they interacted with one another and with the music therapist in the session. Through microanalysis of client-initiated music experiences, description and interpretation of significant moments of interaction between the music therapist and the siblings, and a thematic analysis of those descriptions and interpretations, the following themes and subthemes were identified: Fields of Trust, with subthemes of Existing and Continually Developing Relationships and Newly Established Relationships; Communication Beyond Words, with subthemes of Communication Through Physical and Gestural Cueing, Communication Through Eye Gaze, and Attunement and Mirroring Through Musical Communication; and Independence Within Interdependence.

Theme #1: Fields of Trust

Trust across all three individuals emerged as a consistent theme throughout each experience. A, N, and MT each have at least one existing relationship and one developing relationship within the session, all with varying levels of comfortability. Within the existing relationship between A and MT, both individuals are aware of the openness of the music space to the creative expression and initiative of all participants. A is aware of the opportunities for instrument exploration as established by MT in his previous individual sessions, as well as in his previous experiences over the years in music therapy, and A knows he is encouraged to interact with instruments in his own time. In trusting MT, A shows comfortability to extend that trust to

N, who has had little prior relationship or trust with MT. Within the existing relationship between A and N, it is clear that the siblings have a strong understanding of one another. A trusts that N will accept his offerings and also trusts that N will initiate ideas that A can join into, while N trusts that A is safe to explore freely and will share wants and needs through physical and visual cues. Within the newly established relationship between N and MT, N shows that he feels supported by MT, in both the way MT responds to his sibling and the way MT is reflective and holding in the music. In the development of this one session, N shows comfortability to explore his own creativity and establish trust in his collaborative role in A's treatment within the present session as it unfolds. Elizabeth Schwartz's book *Music, Therapy, and Early Childhood: A Developmental Approach* (2008) explores concepts of trust in early childhood that are applicable here. Schwartz (2008) states that "trust is the structuring and organization of response to awareness. It involves very primitive understanding of boundaries and shapes and relationships. With trust, the young child reaches out and finds a response that helps to form a perception of the world as a place that has meaning, reliability, and safety" (p. 67). A, N, and MT all reach out to each other in ways that highlight these elements of trust, supporting the importance of trust and the possibility of quickly developing trust within the music therapy space.

Theme #2: Communication Beyond Words

A, N, and MT incorporate a variety of ways of connecting, including nonverbal communication in physical and gestural cueing, and musical communication in attunement and mirroring. Physical and gestural cueing is consistent between A and N in the way they offered instruments to one another and in N's attempts to reengage A and maintain A's engagement. N often incorporates visual cues to initiate, and moves to verbal cueing and physical cueing as the next step to interaction and engagement with A, allowing A to explore his autonomy and

creativity. With A's most frequent form of communication being non-verbal, the subtleties in his movements and eye gaze are significant in understanding what he wishes to express. A shows N what instruments he wants to play, watches N while N navigates an instrument, and shows intense focus on N or the instruments he is playing with N at certain points in the session. Many instances of smiling and engagement due to such nonverbal cueing lead to the expansion of connection and interaction either before or within an improvisation. This is supported by Funahashi's finding (2022) that music therapy contributes to the development of adolescent nonverbal communication within the DIR-Floortime approach. Funahashi (2022) observes that improvisational music therapy works through layers of interpersonal engagement and intrinsic motivation, as well as providing a space to "just be" and express emotions in a client's own voice. This correlates with N and A's continued development of ways to uniquely convey their needs and explore their music independently and as a dyad over the course of the session.

Attunement and mirroring through joint music-making contribute to rich interactions within each music experience. N and A often attune to one another quickly through incorporating new musical ideas and synchronizing their tempos and rhythms. N and A also attune to each other's emotions by playing faster in moments of excitement and smiling at one another when a new idea is incorporated. MT also attunes to N and A, leaving space in the music for the siblings' responses or adjustments as they explore instruments together, or adding her voice to her guitar accompaniment to add texture and intensity in response to the siblings' activity and expression. This connects to Jacobsen and Thompson's (2017) observation that music therapists in improvisational family-centered music therapy can follow the lead of a client, echo tempo and dynamics of the client's music, and create lyric content portraying the client's actions. MT's

attunement to these aspects of A and N's music allows for their individual music to become a more joint and connected experience with all people in the music space.

N and A often mirror the rhythm or other elements of each other's movements and instrument playing. These reflected elements become a starting point for each of them to expand into their own individualized responses. A most often mirrors N, reflecting N's playing on the wind chimes through playing from lowest to highest tones, playing on the accordion through button pressing, and playing shakers through hand switching. In each of these examples, A incorporates an element of his own music to expand upon the reflected ideas and make them his own, including body movements and pressing new buttons on the same instrument to create harmony. Both N and A show recognition of these moments of mirroring by smiling and continuing the mirrored element while maintaining their connection with MT's improvisation. This aligns with Thompson's observations (2012) of an autistic child mirroring his mother's movements, focusing his eye gaze on his mother and laughing. N and A's interactions within the music experiences highlight the sibling relationship and the ability to connect and communicate without using words at all.

Theme #3: Independence Within Interdependence

A and N demonstrate a variety of moments of independence within their interdependence with each other and with MT. It is clear through N's consistent initiation and evident desire to connect and maintain engagement with A that he has a caretaker role in place outside of the music space. N also shows his understanding of A's processing time and allows for A to explore his autonomy in the creative process of music making. At the same time, N often looks to the adult in the room, MT, for direction or confirmation or guidance. This shows N's initiative while demonstrating that MT's music creates a space for interdependence in initiating and continuing

musical ideas. A also takes on leadership roles within the music experience, showing N different areas within a musical phrase to place their music. A is expressing his comfort with the music therapy process and sharing that with N, ultimately working toward his music therapy goals of initiation and connection with others. This is supported by Wright and Benigno's (2019) work which demonstrates that sibling involvement in treatment can provide a context that relates to peer interaction.

Along with these previous supporting studies, the present researcher's own lived experience also highlights the caretaker role of the neurotypical sibling, taking on what is conventionally an older sibling role to protect their autistic older sibling, and provide support to their parents by relaying information from the peer lens. The researcher's lived experience also supports the nuanced connection that music and the relationship within the music space can bring, as the researcher has found the deepest part of the sibling connection to be present in that space. N and A's creative initiatives and engagement within improvisational music therapy demonstrate the interdependence of this particular sibling dyad, underscoring the peer interaction that promotes the development of a variety of social skills within the sibling relationship.

Clinical Implications for the Field of Music Therapy

Music therapy is based within the relationship between client and therapist, and improvisational music therapy allows for the ability to meet individuals where they are and expand the possibilities within music experiences. The inclusion of the neurotypical sibling in the music space brings the unique perspective of someone who more frequently interacts with the autistic sibling as well as a more peer-related experience, all of which can be integrated outside of the music therapy space into other contexts within the siblings' lives. Additionally, music

therapy provides the opportunity for nonverbal communication and highlights different ways for individuals to connect more deeply with those around them.

Theme 1, Fields of Trust, focuses on the importance of the relationships among music therapists and clients. This theme emphasizes how quickly trust can develop within improvisational music therapy and the importance of that trust, among all individuals involved, in creating a safe environment within which the autistic individual can work toward their therapeutic goals. Theme 2, Communication Beyond Words, highlights various forms of nonverbal communication and the significance of nonverbal communication in the development and maintenance of relationships among autistic individuals and the people with whom they interact. A focus on nonverbal communication as a space for both neurotypical and autistic individuals to explore and express themselves can create ongoing dialogue among professionals and serve as a basis of advocacy for music therapy. Theme 3, Independence Within Interdependence, highlights previously unrecognized aspects of the relationship between neurotypical and autistic siblings and the importance of neurotypical siblings' role in their autistic siblings' lives, and could encourage a more active role of the family unit within autistic family members' treatment. This may also invite interactions between music therapists and clients' family units. Strategies that are effective in supporting the autistic family member's communication and interaction at home may be brought into the music therapy setting, while effective strategies in the music therapy session may be implemented in the home as well. This could provide an opportunity for increased generalization in areas of social communication and reciprocity, restricted or repetitive patterns in motor movements, speech, and routine, and/or sensory aspects of a given environment as described by the *Diagnostic and Statistical Manual of*

Mental Disorders - Fifth Edition (American Psychiatric Association, 2013), across multiple aspects of the autistic individual's life both within and outside the music space.

Limitations

Limitations of this study included a small sample size and limited time. An established sibling dyad in music therapy is not common; hence, it was challenging to find potential sibling dyads and music therapists to participate in the study. A larger sample size with more siblings of diverse age and cultural identity, as well as more music therapists with diverse theoretical orientations, would allow for an even deeper understanding of the relationship between autistic and neurotypical siblings in improvisational music therapy.

Due to the limitation in time, it was not possible to explore themes across sessions. Individuals present differently each session, and the ability to observe multiple sessions across time would allow for more nuanced data to solidify the generalizability of the findings for this particular dyad.

Recommendations for Future Research

This study aimed to explore an autistic and neurotypical sibling dyad within improvisational music therapy experiences. The method of microanalysis would be recommended for future research of this nature, as it allowed systematic investigation of music excerpts in relation to one another and the formulation of themes based upon both visual and aural data, creating a holistic picture of the music experiences.

To expand upon the ideas within this study, a future study could be conducted to explore multiple sibling dyads, within multiple age ranges, over an extended period of time. This could aid in the discovery of more in-depth themes across multiple sessions, illuminating

commonalities and differences among the client responses, music therapist interventions, and music experiences. A larger sample size could provide opportunity for the inclusion of a wider variety of sociocultural backgrounds and highlight the importance of recognizing the uniqueness of each individual and their functioning in the world. Additionally, participation of sibling dyads with differing gender identities, larger or smaller age gaps, and difference in birth order between the neurotypical and autistic siblings would allow deeper understanding of the sibling relationship in connection with the ways music is explored and experienced within the music therapy setting, whether that be at a creative arts facility or in the home.

CHAPTER 6: CONCLUSION

The purpose of this study was to explore the sibling relationship within improvisational music therapy, specifically the relationship between an autistic sibling and a neurotypical sibling. Microanalysis of music experiences initiated by the siblings within an archived session video uncovered three themes: Fields of Trust, Communication Beyond Words, and Independence Within Interdependence. Results highlighted the importance of the sibling relationship within music experiences, as well as the relationship between the music therapist and the clients, the subtleties of communication through gestures and music, and comfortability to explore within the familiarity of guidance from others in a session of improvisational music therapy. The findings of this study, along with future studies related to this topic, may support the inclusion of siblings within the improvisational music therapy space, especially autistic and neurotypical sibling dyads.

REFERENCES

American Music Therapy Association. What is Music Therapy? American Music Therapy Association (AMTA). (n.d.). https://www.musictherapy.org/about/musictherapy/

Ariel, C. N., & Naseef, R. A. (2005). *Voices from the spectrum: Parents, grandparents, siblings, people with autism, and professionals share their wisdom* (First, pp. 158-160.). Jessica Kingsley Publishers.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology.* 77-101. https://doi.org/10.1191/1478088706qp063oa.

Bruscia, K. E. (1987). *Improvisational models of music therapy*. C.C. Thomas

Bruscia, K. E. (2014). *Defining music therapy (3rd edition)*. Barcelona Publishers.

Caria, A., Venuti, P., & de Falco, S. (2011). Functional and dysfunctional brain circuits underlying emotional processing of music in autism spectrum disorders. *Cerebral Cortex*, *21*(12), 2838–2849. https://doi.org/10.1093/cercor/bhr084

Carpente, J., & LaGasse, A. (2015). Music therapy for children with autism spectrum disorder. In B. L. Wheeler (Ed.), Music therapy handbook (pp. 290-301). The Guilford Press.

Carpente, J. (2017). Investigating the Effectiveness of a Developmental, Individual Difference, Relationship-Based (DIR) Improvisational Music Therapy Program on Social Communication for Children with Autism Spectrum Disorder. *Music Therapy Perspectives*, miw013–. https://doi.org/10.1093/mtp/miw013

Center for Disease Control and Prevention. (2022, December 9). *ASD diagnosis, treatment, and services.* https://www.cdc.gov/ncbddd/autism/facts.html

Cibrian, F. L., Madrigal, M., Avelais, M., & Tentori, M. (2020). Supporting coordination of

children with ASD using neurological music therapy: A pilot randomized control trial comparing an elastic touch-display with tambourines. *Research in Developmental Disabilities*, *106*, 103741–103741. https://doi.org/10.1016/j.ridd.2020.103741

Cook, Ogden, J., & Winstone, N. (2019). The impact of a school-based musical contact intervention on prosocial attitudes, emotions and behaviours: A pilot trial with autistic and neurotypical children. *Autism: the International Journal of Research and Practice*, *23*(4), 933–942. https://doi.org/10.1177/1362361318787793

Crompton, C. J., Hallett, S., Ropar, D., Flynn, E., & Fletcher-Watson, S. (2020). "I never realised everybody felt as happy as I do when I am around autistic people": A thematic analysis of autistic adults' relationships with autistic and neurotypical friends and family. *Autism: the International Journal of Research and Practice*, *24*(6), 1438–1448. https://doi.org/10.1177/1362361320908976

Diagnostic and statistical manual of mental disorders : DSM-5. (5th ed.). (2013). American Psychiatric Association.

Dunn, Y. (2020). *Social work with autistic people: Essential knowledge, skills and the law for working with children and adults*. Jessica Kingsley Publishers.

Eilat, Y., & Raichel, N. (2016). An Inclusive School Choir for Children with Autism in Israel: Using Grounded Theory to Explore the Perceived Benefits and Challenges. Voices : a World Forum for Music Therapy, 16(1). https://doi.org/10.15845/voices.v16i1.849

Funahashi, N. (2022). *The non-verbal expressions and experiences of an autistic adolescent in improvisational, relationship-based music therapy* [Master's thesis, Molloy College]. Digitalcommons Work.

Geretsegger, Holck, U., Carpente, J. A., Elefant, C., Kim, J., & Gold, C. (2015). Common Characteristics of Improvisational Approaches in Music Therapy for Children with Autism Spectrum Disorder: Developing Treatment Guidelines. *The Journal of Music Therapy,* 52(2), 258–281. https://doi.org/10.1093/jmt/thv005

Guerrero, N., & Turry, A. (2012). Nordoff-Robbins Music Therapy An Expressive and Dynamic Approach for Young Children on the Autism Spectrum. In P. Kern & M. Humpal (Eds.), *Early childhood music therapy and autism spectrum disorders: Developing potential in young children and their families*. Jessica Kingsley.

Guerrero, N., Marcus, D., & Turry, A. (2015). Nordoff-robbins music therapy. In B. L. Wheeler (Ed.), Music therapy handbook (pp. 183-195). The Guilford Press.

Heaton, P. (2003). Pitch memory, labelling and disembedding in autism. *Journal of Child Psychology and Psychiatry*, *44*(4), 543–551. https://doi.org/10.1111/1469-7610.00143

Hiller, J. (2016). Epistemological Foundations of Objectivist and Interpretivist Research. In B. L. Wheeler & K. M. Murphy (Eds.), *Music Therapy Research* (Third, pp. 99–117). essay, Barcelona Publishers.

Huskens, B., Palmen, A., Werff, M., Lourens, T., & Barakova, E. (2015). Improving collaborative play between children with autism spectrum disorders and their siblings: The effectiveness of a robot-mediated intervention based on Lego (R) therapy. *Journal of Autism and Developmental Disorders*, *45*(11), 3746–3755. https://doi.org/10.1007/s10803-014-2326-0

Izen, Cassano-Coleman, R. Y., & Piazza, E. A. (2023). Music as a window into real-world communication. *Frontiers in Psychology*, *14*, 1012839–1012839. https://doi.org/10.3389/fpsyg.2023.1012839

Jacobsen, S. L., & Thompson, G. A. (Eds.). (2017). *Music therapy with families: Therapeutic approaches and theoretical perspectives*. Jessica Kingsley Publishers.

Kearney, A. J. (2015). *Understanding applied behavior analysis: An introduction to ABA for parents, teachers, and other professionals* (Second edition.). Jessica Kingsley.

Kim, S.-A., & Elefant, C. (2016). Epistemological Foundations of Objectivist and Interpretivist Research. In B. L. Wheeler & K. M. Murphy (Eds.), *Music Therapy Research* (Third, pp. 74–83). essay, Barcelona Publishers.

Lim, A. & Draper, E. (2011). The Effects of Music Therapy Incorporated with Applied Behavior Analysis Verbal Behavior Approach for Children with Autism Spectrum Disorders. *The Journal of Music Therapy*, *48*(4), 532–550. https://doi.org/10.1093/jmt/48.4.532

Merriam-Webster. (n.d.). *Neurotypical Definition & Meaning*. Merriam-Webster. https://www.merriam-webster.com/dictionary/neurotypical

Mössler, K., Halstead, J., Metell, M., Gottschewski, K., & Schmid, W. (2023). "The room is a mess": Exploring the co-creation of space for attunement dynamics between an autistic child and a non-autistic music therapist. *Nordic Journal of Music Therapy*, (ahead-of-print), 1–21. https://doi.org/10.1080/08098131.2022.2145346

Nordoff, P., & Robbins, C. (2007). *Creative music therapy: A guide to fostering clinical musicianship* (2nd ed). Gilsum, NH: Barcelona.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*. https://doi.org/10.1177/1609406917733847

Orsmond, G., Kuo, H.-Y., & Seltzer, M. M. (2009). Siblings of individuals with an autism

spectrum disorder: Sibling relationships and wellbeing in adolescence and adulthood. *Autism: the International Journal of Research and Practice*, *13*(1), 59–80. https://doi.org/10.1177/1362361308097119

Rudy, L. J. (2023). *What does 'neurotypical' mean?* Verywellhealth. https://www.verywellhealth.com/what-does-it-mean-to-be-neurotypical-260047#toc-what-is-a-neurotypical-person

Schwartz, E. (2008). *Music, therapy, and early childhood : a developmental approach*. Barcelona Publishers.

Smith, L. O., Elder, J. H., Storch, E. A., & Rowe, M. A. (2015). Predictors of sense of coherence in typically developing adolescent siblings of individuals with autism spectrum disorder. *Journal of Intellectual Disability Research*, *59*(1), 26–38. https://doi.org/10.1111/jir.12124

Spector, V., & Charlop, M. H. (2017). A sibling-mediated intervention for children with autism spectrum disorder: Using the natural language paradigm (NPL). Journal of Autism and Developmental Disorders, 48, 1508–1522. https://doi.org/10.1007/s10803-017-3404-x

Tager-Flusberg, H., Paul, R., & Lord, C. (2005). Language and Communication in Autism. In *Handbook of Autism and Pervasive Developmental Disorders* (pp. 335–364). John Wiley & Sons, Inc. https://doi.org/10.1002/9780470939345.ch12

Thompson, G. A. (2012). Family-centered music therapy in the home environment: promoting interpersonal engagement between children with autism spectrum disorder and their parents. *Music Therapy Perspectives*, *30*(2), 109–116. https://doi.org/10.1093/mtp/30.2.109

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

Vlachová, Z. (2022). Means of Musical Dialogues and Reciprocity: Improvisational Music Therapy for Social Interaction of a Preschool Child with Autism Spectrum Disorder. *Voices : A World Forum for Music Therapy*, *22*(2), 1-. https://doi.org/10.15845/voices.v22i2.3191

World Health Organization. https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders?gclid=Cj0KCQiAmNeqBhD4ARIsADsYfTdjIr0ttLKrsUVz1Uslx6htQPZybeS8ivXZyslrdltETooy9OAKZkUaAr2YEALw_wcB

Wheeler, B. (2015). *Music therapy handbook* (Wheeler, Ed.). The Guilford Press.

Wieder, S., & Greenspan, S. I. (2003). Climbing the symbolic ladder in the DIR model through floor time/interactive play. *Autism : The International Journal of Research and Practice*, 425–435.

Wosch, T., & Wigram, T. (2007). *Microanalysis in music therapy methods, techniques and applications for clinicians, researchers, educators and students*. Jessica Kingsley.

Wright, B. M., & Benigno, J. P. (2019). Autism spectrum disorder and sibling relationships: Exploring implications for intervention using a family systems framework. *American Journal of Speech-Language Pathology*, *28*(2), 759–767. https://doi.org/10.1044/2018_AJSLP-18-0088

Xu, J., Zhou, L., Liu, F., Xue, C., Jiang, J., & Jiang, C. (2022). The autistic brain can process

local but not global emotion regularities in facial and musical sequences. *Autism Research*, *15*(2), 222–240. https://doi.org/10.1002/aur.2635

APPENDICES

Appendix A: IRB Approval

MOLLOY UNIVERSITY

1000 Hempstead Ave., PO Box 5002, Rockville Center, NY 11571-5002
www.molloy.edu

Patricia A. Eckardt, PhD, RN, FAAN
Chair, Molloy University Institutional Review Board
Professor, Barbara H. Hagan School of Nursing and Health Sciences
E: peckardt@molloy.edu
T: 516.323.3711

DATE: January 17, 2024

TO: Gianna DeRusso
FROM: Molloy University IRB

PROJECT TITLE: [2141118-1] The Experience of an Autistic and Neurotypical Sibling Dyad in Improvisational Music Therapy
REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: January 17, 2024
EXPIRATION DATE: January 16, 2025
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category #7

Thank you for your submission of New Project materials for this project. The Molloy University IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on applicable federal regulations.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others (UPIRSOs) and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

This project has been determined to be a MINIMAL RISK project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval45 days before the expiration date of January 16, 2025.

Appendix B: Informed Consent Form

Graduate Music Therapy
1000 Hempstead Avenue
Rockville Centre, NY 11570
1-888-466-5569

Title of Study: THE EXPERIENCE OF AN AUTISTIC AND NEUROTYPICAL SIBLING DYAD IN IMPROVISATIONAL MUSIC THERAPY

This study is being conducted by:

Gianna DeRusso, MT-BC gderusso@lions.molloy.edu

Maria Guerrero, PhD, MT-BC mguerrero@lions.molloy.edu

Key Information about this study:

This consent form is designed to inform you about the study in which your children are being invited to participate. As a parent/guardian, you will be consenting on behalf of your children, who will also be asked for their assent. Here you will find a brief summary about the study; however, you can find more detailed information later on in the form.

This study is being conducted to understand the interactions between a sibling dyad with one Autistic sibling and one neurotypical sibling in a session of improvisational music therapy. The researcher will be analyzing an archived video of a session that has already occurred. Hence, participation in the study will not require any further action by the participants. All data collected will be stored in a HIPAA-compliant Dropbox account to which only the researcher and the researcher's thesis advisor will have access.

Why am I being asked to take part in this study?

This study will help music therapists to better understand sibling dyads like this one. Although Autistic individuals often take part in services on their own or with their peers, the sibling relationship is different from all of these experiences. There is a comfortability while also a peer-like experience in the sibling relationship, and participating in improvisational music experiences with a sibling may support the relationship and the individuals in many ways.

What will I be asked to do?

Parents/guardians will be asked to provide their Autistic child's IEP as evidence of diagnosis. No further action is required by the parents/guardians or their children.

Where is the study going to take place, and how long will it take?

This study will not require any additional time from the participants, as the researcher will analyze an existing archived video recording of a music therapy session.

What are the risks and discomforts?

The risks and discomforts of this study will be minimal, and will be comparable to those of everyday life. It is not possible to identify all potential risks in research; however, reasonable safeguards have been taken to minimize known risks. If new findings develop during the course of the research which may change your willingness to give permission for your children to participate, we will tell you about these findings.

What are the expected benefits of this research?

The participants will not benefit directly from the research, although music therapists may gain insight into the relationship of Autistic individuals with their neurotypical siblings in the context of improvisational music therapy, and may thus be better equipped to serve Autistic and neurotypical sibling dyads.

Do I have to take part in this study?

Your children's participation in this research is your choice and their choice. If you decide to consent for them to participate in the study, you may change your mind and stop their participation at any time without penalty or loss of benefits to which they are already entitled.

What are the alternatives to being in this study?

Instead of consenting for your children to participate in this research, you may choose for them not to participate.

Who will have access to my information?

Only the primary investigator (Gianna DeRusso) and the thesis advisor (Maria Guerrero) will have access to the username and password of the HIPAA-compliant Dropbox account on which the video recording and all participant information will be stored.

How will my information be used?

The information collected through viewing an archived video recording of a music therapy session will be analyzed by the primary investigator via a microanalysis, which means that the researcher will examine specific aspects of the music that occurs within the session in relation to the communication and interaction between the siblings.

To ensure that this research activity is being conducted properly, Molloy University's Institutional Review Board (IRB), whose members are responsible for the protection of human subjects' rights for all Molloy-approved research protocols, have the right to review study records, but confidentiality will be maintained as allowed by law.

Can my participation in the study end early?
Participation in this study is voluntary and can be stopped at any time. Any collected data will be destroyed upon the withdrawal of the participants.

Will I receive any compensation for participating in the study?
There is no compensation for participating in this study.

What if I have questions?
Before you decide whether you wish for your children to participate in this study, please ask any questions that come to mind now. Later, if you have questions about the study, you can contact Gianna DeRusso, MT-BC, at gderusso@lions.molloy.edu, or Maria Guerrero, PhD, MT-BC, at mguerrero@molloy.edu.

What are my children's rights as research participants?

Research participants have rights. All research with human participants is reviewed by a committee called the *Institutional Review Board (IRB)* which works to protect participants' rights and welfare.

If you have questions about your children's rights as participants in research, your rights as a parent/guardian, an unresolved question, or a concern or complaint about this research, you may contact the Molloy IRB office at irb@molloy.edu, or the IRB CHAIR, Dr. Patricia A. Eckardt, at peckardt@molloy.edu or 516-323-3000.

Documentation of Informed Consent:

You are freely making a decision whether to consent for your children to be in this research study. Signing this form means that:

1. **You have read and understood this consent form.**
2. **You have had your questions answered, and**
3. **After sufficient time to make your choice, you have decided to consent for your children to be in the study.**

You will be given a copy of this consent form to keep.

_____ _____

Your signature Date

_____ _____

Your printed name Date

I hereby consent for the researcher to view and analyze an archived video recording of a music therapy session with my children.

_____ _____

Signature of researcher explaining study Date

_____

Printed name of researcher explaining study

Appendix C: Assent Form For Neurotypical Sibling

MOLLOY UNIVERSITY

ADOLESCENT (Ages 13-17) ASSENT TO PARTICIPATE IN RESEARCH

THE EXPERIENCE OF AN AUTISTIC AND NEUROTYPICAL SIBLING DYAD IN IMPROVISATIONAL MUSIC THERAPY

You are asked to participate in a research study conducted by *Gianna DeRusso* and associates from the *Graduate Music Therapy Department*, at Molloy University, Rockville Centre, NY. You were selected as a possible participant in this study because *you are a sibling of an individual diagnosed with Autism who attends music therapy sessions*. Your participation in this research study is voluntary.

Why is this study being done?

This study is being done to understand the relationship between a sibling diagnosed with Autism and their sibling who is not diagnosed with Autism in music therapy. This study will help other music therapists to understand how to work in music with people just like you and your sibling.

What will happen if I take part in this research study?

Please talk this over with your parents before you decide whether or not to participate. We will also ask your parents to give their permission for you to take part in this study. But even if your parents say "yes," you can still decide not to do this.

If you volunteer to participate in this study, the researcher will ask you to do the following:

1. You will not be required to do anything else. The researcher will be looking at a video of a session with you and your Autistic sibling that has already happened.

How long will I be in the research study?

You will not be asked to do anything in the research study, so it will not take you any extra time.

Are there any potential risks or discomforts that I can expect from this study?

There are no anticipated risks or discomforts.

Are there any potential benefits if I participate?

You will not directly benefit from your participation in the research.

The results of the research may help others understand the experience of having a sibling diagnosed with Autism, and how music may have an impact on your relationship.

Will I receive any payment if I participate in this study?

You will receive no payment for your participation.

Will information about me and my participation be kept confidential?

Any information that is obtained in connection with this study and that identifies you will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of *a safe account on a site called Dropbox that only myself and my advisor will have access to.*

What are my rights if I take part in this study?

You may withdraw your assent at any time and discontinue participation without penalty or loss of benefits to which you were otherwise entitled.

You can choose whether or not you want to be in this study. If you volunteer to be in this study, you may leave the study at any time without consequences of any kind. You are not waiving any of your legal rights if you choose to be in this research study. You may refuse to answer any questions that you do not want to answer and still remain in the study.

Who can answer questions I might have about this study?

In the event of a research related injury, please immediately contact one of the researchers listed below. If you have any questions, comments or concerns about the research, you can talk to one of the researchers. Please contact *Gianna DeRusso at gderusso@lions.molloy.edu*.

COVID-19 Understanding
You agree that as a condition of your willing and voluntary participation in activities involving any faculty, students, and facilities of Molloy University:
1. You understand that Molloy University has issued rules and precautions which follow or exceed guidance from the Centers for Disease Control (CDC) and the New York State Department of Health regarding COVID 19 and its variants. You agree that it is your sole responsibility to follow these and any applicable local protocols and acknowledge that failure to do so may result in removal from these activities.
2. You acknowledge the contagious nature of COVID-19 and its variants, and you are understanding that, even with adherence to all preventative measures, including vaccination, there is risk that you may become exposed to and/or contract COVID-19 or its variants.
3. You assume all risk of such exposure or infection and acknowledge that it may result in personal injury, or illness, and has known to be even fatal.

If you have questions about your rights as a research subject, or you have concerns or suggestions and you want to talk to someone other than the researchers, you may contact the Molloy IRB at irb@molloy.edu, or the IRB CHAIR, Dr. Patricia A. Eckardt, at peckardt@molloy.edu or 516-323-3000.

SIGNATURE OF STUDY PARTICIPANT

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

_____
Name of Participant

_____ _____
Signature of Participant Date

SIGNATURE OF PERSON OBTAINING ASSENT

In my judgment the participant is voluntarily and knowingly agreeing to participate in this research study.

_____ _____
Name of Person Obtaining Assent Contact Number

_____ _____
Signature of Person Obtaining Assent Date