

EXAMINING THE FUNCTIONS OF INFANT MUSICALITY WITHIN A
CHILDCARE COMMUNITY

by

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ABSTRACT

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The purpose of this case study was to explore and understand the function of music in an infant community. By observing the musical behaviors of seven children under the age of two in both childcare and home settings, I sought to gain new insights that can inform parents, caregivers, and educators about the engagement with and possible functions of music for infants. The theories of Communicative Musicality and psychobiological needs informed this study and provided the lenses through which I observed infant musicality.

Data collection comprised semi-structured interviews with parents at home, interviews with teachers, weekly infant room observation fieldnotes, weekly infant music class video observations, parent and teacher diary entries, and artifacts such as memos, videos, and photos from the childcare and home settings. Data analysis involved identifying infant musical behaviors and their possible functions with respect to the child's musical experience, framed as episodes. Through the use of portraiture, the

individual music making of each infant was described within the contexts of the home, school, field observation, and music class settings, and relationships that developed through musical interactions were highlighted within the infant community.

Results indicate that vocal and movement behaviors were the most prominent behaviors identified overall, and communication had the highest frequency of all functions. In contrast to the school-based teacher and researcher field observation settings where vocal behaviors were high, movement behaviors were identified as most prevalent during music class. The child-centered emergent curriculum provided space for the infants to demonstrate choice and leadership by setting up musical toys, pointing to an instrument, moving to indicate direction in a song, bringing song books to adults, singing fragments of songs, participating on the periphery, and gesturing for more. Infants listened and engaged in music class by moving and playing instruments and displayed their attentiveness by later recalling and initiating these activities in other settings. Increased infant room vocalizations outside music time included those resulting from delayed imitation and extensions from music class. Music is a social endeavor wherein infants build community, motivating leadership, friendship, and kinship.

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DEDICATION

For all the personalities of the Infant Room, 2016 – 2017

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TABLE OF CONTENTS

I – INTRODUCTION	1
Narrative	1
Background	5
Problem Statement	9
Purpose Statement	11
Definitions and Assumptions	12
Plan of Research	13
Research Questions	13
Overview of Method	14
Delimitations	15
Plan for Remaining Chapters	15
II – REVIEW OF LITERATURE.....	16
Overview	16
Infants and the Social World.....	16
Infants with Adults.....	17
Infants with Their Peers	18
Infants in Community	20
Infants, Music, and the Social World.....	21
Communicative Musicality	22
Psychobiological Needs	23
Mutuality.....	23
Belonging.....	24
Finding and making meaning.....	25
Hands-on competence.....	25
Elaboration.....	26
Adult Roles in Music with Infants	26
Reciprocity.....	27
Parents as musical mentors	28
Teachers as musical mediators and enhancers.....	29
The Functions of Music for Infants	30
Music for Communication	30
Music for Comfort	34
Music for Exploration.....	37
Music Behaviors in Infancy	41
Vocalizations.....	41
Movement	44
Conclusion	46

III - METHODOLOGY	47
Overview	47
Research Approach	48
Researcher Role	52
Pilot Study.....	54
Participants and Setting.....	57
Instrumentation and Data Collection	59
Interviews.....	59
Field and Video Observations.....	60
Document Review.....	62
Parent and Teacher Diaries	62
Data Collection and Procedures.....	63
Data Analysis	67
RQ 1. What are the ways in which infants are musical?	67
RQ 2a. What do parents report regarding musical behaviors in the home?.....	67
RQ 2b. What do teachers report regarding musical behaviors during music time and outside of music time?.....	68
RQ 2c. How do musical behaviors of infants vary depending on whom they are with?.....	68
RQ 3. What function(s) do the musical behaviors serve?.....	68
Ethical Considerations	72
Issues of Trustworthiness.....	73
Chapter Summary	75
IV – PORTRAITS OF FOUR INFANTS AGES 15 TO 23 MONTHS OLD.....	76
Introduction.....	76
Cyndi: The Supersonic Listener.....	80
Parents’ Lens: Musical Cyndi at Home	80
Listening and agency.	80
Moving to music alone and with others.....	83
Playing piano in community.	84
Singing alone and in duet.....	85
Teachers’ Lens: Musical Cyndi at School	86
Requesting from song books.....	86
Responding with movement.	86
Researcher’s Lens: Peeking into the Infant Room.....	88
Tuneful verbal cues.....	88
Engaging others through song.	89
Discovering resonance in object.	90
Music Teacher’s Lens: Group Music.....	91
Moving in response to music.	91
Taking control of musical activities and making them her own... ..	92
Summary of Cyndi.....	93
Frederic the Triple Threat: Singer, Mover, and Shaker	94
Parents’ Lens: Musical Frederic at Home.....	94
Moving to music for an active Frederic.....	95

Creating musical space through instrument play.....	97
Surprising musical moments.....	98
Music seems to speak to Frederic.....	99
Teachers' Lens: Musical Frederic at School.....	100
Singing during solitary play.....	101
Triggers to musical behavior.....	103
Researcher's Lens: Peeking into the Infant Room.....	107
Singing alone when engaged in activity.....	107
Music at the snack table.....	108
Musical moments during diaper changes.....	109
Music Teacher's Lens: Group Music.....	110
Enjoys dancing with a partner.....	110
Attraction to the shakers.....	111
Summary of Frederic.....	112
Lily: The Nurtured and the Nurturer.....	113
Parents' Lens: Musical Lily at Home.....	113
Vocalizing reinforces singing.....	114
Moving and dancing ritual with parent.....	115
Requesting songs by singing and moving.....	117
Music soothes the savage Lily.....	118
Teachers' Lens: Musical Lily at School.....	119
Requesting songs by singing and moving.....	119
Music in play.....	121
Researcher's Lens: Peeking into the Infant Room.....	123
Singing during diaper changes.....	123
Music in play.....	125
Music Teacher's Lens: Group Music.....	127
Singing while playing during group music.....	127
Ways of requesting during music time.....	129
Play in music.....	130
Summary of Lily.....	131
Benny: Mr. Timbre Man.....	132
Parents' Lens: Musical Benny at Home.....	132
Dancing at home.....	132
Playing objects for sounds.....	134
Vocalizing for sounds.....	135
Teachers' Lens: Musical Benny at School.....	138
Vocalizing in the nap room.....	138
Vocalizing with peers.....	139
Listening to songbooks.....	141
Researcher's Lens: Peeking into the Infant Room.....	142
Vocalizing with instrument playing during play.....	142
Vocal sounds during routines.....	144
Music Teacher's Lens: Group Music.....	146
Moving and playing together.....	146
Moving and playing from the periphery.....	146

Summary of Benny	148
V – PORTRAITS OF THREE INFANTS AGES 6 TO 15 MONTHS OLD	151
Max: The Sound Explorer.....	151
Parents’ Lens: Musical Max at Home.....	151
Testing objects for sound repertoire.	152
Discovering and moving to sounds.....	153
Movement and gesture as request.	154
Teachers’ Lens: Musical Max at School.....	156
Listening diminishes distress	156
Shakers and spoons.	157
Conversations through musical vocalizations.....	158
Moving and connecting to sound sources.	159
Researcher’s Lens: Peeking into the Infant Room.....	161
Vocalizing and moving with objects.....	161
Music behaviors at the table.	164
The Music Teacher’s Lens: Group Music	166
Participating within the group.....	166
Participating from the periphery.	170
Leading the group.	171
Summary of Max	173
Ashlee: The Musical Social Butterfly.....	175
Parents’ Lens: Musical Ashlee at Home.....	175
Creating at the keyboard.	176
Home and school influences.	178
Listening and being moved.	180
Teachers’ Lens: Musical Ashlee at School.....	182
Unique vocal sounds.	182
Requesting by gesture.	184
Attraction to sounds brings about responsive listening.	185
Researcher’s Lens: Peeking into the Infant Room.....	186
Listening and singing during diaper changes.....	186
Trampoline attraction.....	188
Instrument play to accompany the infant room.	189
Music Teacher’s Lens: Group Music.....	191
Imitating and partnering during singing.	191
Moving and singing with others.	193
Summary of Ashlee.....	195
Devynn: The Motivated Musicker	196
Parents’ Lens: Musical Devynn at Home	196
Vocal sounds with instrument play.....	197
Responses to sound.	199
Music-making with others.	202
Teachers’ Lens: Musical Devynn at School	204
Actively seeking music.	204
Music-making alone and with others.....	205
Researcher’s Lens: Peeking into the Infant Room.....	208

Music from the carpet	208
Musical conversations.....	209
The Music Teacher’s Lens: Group Music	212
Dancing in the infant community.	212
Impetus from music.	213
Summary of Devynn.....	216
VI – DISCUSSION OF FINDINGS	218
Introduction.....	218
Musical Behaviors in Various Settings.....	220
Home View	220
Listening: Music captivates and comforts.	223
Moving: Music to connect.	224
Moving: Creating and responding.	226
Musical preferences and choice.....	227
Musical perception.....	228
School View – Vocal: Music to Enact their world.	229
Researcher’s View into the Classroom—Vocal: Musical Spaces.	233
Music Teacher’s View — Movement: Babies as Musical Initiators.	237
Creating Community through Music	242
Child Culture: Children as Leaders.....	244
Role of Adults	246
Functions of Infant Musicking.....	248
Social Nature of Infants	251
Chapter Summary	254
VII – SUMMARY, FINDINGS, RECOMMENDATIONS, AND IMPLICATIONS ...	256
Research Questions and Findings	257
RQ 1. What are the ways in which infants are musical? (a) What behaviors are considered vocal? (b) What behaviors are considered movement?.....	257
RQ 2. What do parents and teachers report about infants by observing their music making? (a) What do parents report regarding musical behaviors in the home? (b) What do teachers report regarding musical behaviors during music time and outside of music time? (c) How do the musical behaviors of infants vary depending on whom they are with?.....	258
RQ 3. What function(s) do the musical behaviors serve?.....	260
Limitations and Recommendations for Future Research.....	263
Implications for Music Education.....	264
Revisiting my Assumptions	267
Reflection/Coda	268
REFERENCES	271

APPENDICES:

Appendix A – Teacher Interview Protocols.....	278
Appendix B – Parent Interview Protocol	282
Appendix C – Field Observation Protocol.....	285
Appendix D – Music Behaviors Checklist.....	286
Appendix E – Teacher Diary Example and Template	287
Appendix F – Parent Diary Example and Template	289
Appendix G – Invitation Letter for Teachers.....	291
Appendix H – Invitation Letter for Parents	292
Appendix I – Informed Consent for Teachers	293
Appendix J – Informed Consent for Parents.....	299
Appendix K – Episode Guide: Functions	305
Appendix L – Coding Scheme and Example of Coding by Episode.....	307
Appendix M – Photos of Artifacts	308

LIST OF TABLES

Table	Page
1 Ages and Genders of Infants.....	59
2 Data Collection for Field Observations (FO).....	64
3 Timeline of Data Collection.....	66
4 Plan of Analysis Matrix.....	69
5 Number of Episodes Extracted from Data Sources.....	70
6 Infant Age and Episode/Behavior Count.....	77
7 Coding for Functions.....	79
8 Behaviors by Child: Home.....	221
9 Behaviors by Child: School.....	230
10 Behaviors by Child: Field Observations.....	233
11 Behaviors by Child: Music Class.....	238

I – INTRODUCTION

Narrative

In my youth, I remember singing casually, either alone or in front of others. Whether this activity served as a way to entertain or to self-soothe, I sang so frequently that it became attached to my identity. I come from two cultures where traditionally females are not respected for their opinions nor are they associated with having a voice in the larger sense. As an immigrant to the United States, I entered the U.S. school system not speaking a word of English and this language barrier along with being a foreigner led to feelings of inadequacy. Although the lack of language is not synonymous with lack of potential or knowledge, the inability to express myself, and my needs, was inhibiting and led to the realization that my voice was not being *heard*. As my voice became more silent during the hardships that accompanied my adjustments to a new culture and life, song was a physical artifact of culture that offered comfort in a new setting. Through my clear attraction to singing throughout my childhood, I was able to express myself and be responsive to personal and cultural meanings. I used song as a, “transitional object that offered the comfort of the familiar in strange settings” (Custodero, 2002, p. 7) that bridged and filled a gap in my immediate physical space as well as in the cultural space between myself and others. In doing so, I was able to negotiate a space for me in this newly shared world as I began to form my identity.

I did not have the opportunity to study singing or music formally until college where, feeling underqualified once again, I learned as much as I could as fast as I could.

Since then, I have received an undergraduate degree in music education, a graduate degree in vocal performance, and have pursued a career in teaching and singing professionally. The connection of the singing voice to personal identity seems to reveal itself most clearly at times when I have become ill, resulting in my loss of full capacity of my voice as a singing instrument. While I am careful about staying fit and healthy for my instrument to function properly and optimally, I know that suffering from common colds, allergies, or sinus infections are a part of life that can cost a singer their livelihood. The loss of voice, as I have experienced, whether temporary or for the longer term, can cause a range of emotions from fear to depression until my voice is healthfully regained.

I became interested in the study of special needs, although I did not have much experience in this area and began exploring topics related to singing and its functions in speech and vocal therapies. I wanted to find out about proven methods that might encourage the wellbeing of individuals. I was drawn to studies related to stroke victims suffering from nonfluent aphasia, which makes it very effortful to speak or repeat words, while at the same time comprehension is only mildly impaired (Bear, Connors, & Paradiso, 2007).

I observed various individual therapies being applied to stroke survivors aiming to regain their speech capacity. I also observed group singing therapies where individuals find connection to music as well as to community with their fellow stroke survivors. More and more, I began to hear about the clinical benefits of singing in general and of singing in a community setting. These opportunities are also offered for other ailments that inhibit the full use of the voice such as dementia, Parkinson's disease, and Alzheimer's disease.

I began zeroing in on singing as a therapeutic approach for nonfluent aphasia and became deeply interested in the emotional effects on these individuals of having lost their voice and the importance of group singing in their lives in order to regain it. At a colloquium on Music and the Brain, I was exposed to current insights in brain research and their connection to music in clinical settings. I was deeply inspired by this conference, and the idea of voice as a central therapeutic element became even more compelling to me.

I am currently involved in three settings that involve singing and music: adults participating in applied voice lessons, individuals with intellectual and developmental disabilities, and infants. In these settings, I work to discover how individuals might amplify their *voice* through the act of music making. As an applied voice instructor, I have seen how the physical act of engaging the vocal mechanism in tandem with enjoyable repertoire can lead to feelings of discovery and accomplishment. Especially for some beginning singers, it can be a challenge for them to feel comfortable singing for the first time. When they become free from constraints, technical or otherwise, they are able to make the connection between text and emotion, culminating in musical expression. This process for some can lead to self-empowerment of *voice*.

As a music instructor for adults who have intellectual and developmental challenges, I have seen how engagement in music and singing activities becomes a conduit for emotional expression. As a facilitator, and through my personal field notes, I have witnessed how these individuals can connect through singing or by playing instruments within the collective, making use of the safe space provided for expression of individual *voice*. As each individual is unique and has different interests, there usually

needs to be a variety of ways for them to participate in music making. Profound moments are when individuals overcome the challenges that usually place them on the periphery of social activity suddenly become involved in the heart of the group during song, movement, or instrument play.

As the music instructor for a fieldwork course in the music department, I watch graduate students experience and practice implementing musical experiences at a university-affiliated early childhood center. Each week infants, toddlers, and preschoolers experience the music plans we design. I have also been observing these classrooms from the observation booth and within the classroom itself, separate from our music classes. These infants, toddlers, and preschoolers learn through play and discovery. The emergent curriculum is an integral aspect of the center. In preparing for music classes, I enter the classroom with a plan for activities in which we will engage. Sometimes my plan is implemented with few changes, and sometimes I alter it completely in keeping with my interpretation of the needs of the children. Thus, the music curriculum is adapted to their current states in the moment.

I soon realized that an exciting area of study would be to explore the music making of young children within and beyond the educational setting. During my observations, I noticed that music revealed itself in various forms outside of music class. From the children, spontaneous singing and rhythmic movements, for example, become evident in their everyday activities. The teachers also seem to use music as a way to soothe, as well as to instruct the children. I began to identify musical behaviors that emerged from the children at play, as well as those utilized by the adults in the classrooms, and I have become interested in knowing more about how children

demonstrate these musical behaviors. I also became curious about how teachers use music in the classroom and how parents might use music at home with their children. For young children, I wondered if music was a pathway for expression, when speech is still in development. It seemed to me that music provided a way for young children's voices to be enhanced; adults appear to know this instinctively and utilize their own musicality to connect with them.

My previous experiences include working with people from age five to adults. Therefore, early childhood was a new age group for me to experience. Since I began teaching a fieldwork course in this area, I have been learning strategies on how to best work with these groups. I have taken particular interest in the infant classroom, where I have been focusing my time and attention. I find that music exists in the classroom naturally. Instances include and are not exclusive to vocalizations, embodiment of music, physical gestures and repeated rhythmic movements, singing from teachers in the classroom for soothing or instructional purposes, rhythmic patterns that arise as infants beat or strike objects, repetition of sounds on intoned pitches that create some sort of first composition, and song fragments. There are many musical examples if you look and listen for them.

Background

“Infants seem born with a kind of musical wisdom and appetite” (Trevarthen, 2000, p. 173). Babies prefer their mother's singing to maternal speaking, and mothers in turn respond to their infants' natural tendency by speaking in a higher pitched sing-song manner with exaggerated pitch contours, and hyper-articulation of vowels (Mithen, 2009,

p. 4). The vocal and rhythmic interactions between mother and infant begin early, such as a mother rocking her child (Levitin, 2008). Infants are musical beings from the beginning, predisposed to music as part of the, “fabric of life” (Trehub, 2001, p. 2), and this capacity for music implies a biological basis (Mithen, 2009).

When referring to the evolutionary origins of music, there has been a debate about which form of communication existed first, music or language. The vocalizations of early primates with variations in timbre, pitch, and rhythm were the primary forms of communication until language evolved, which was an improved form of information transmission; music now serves as an integral part of expressing emotion and forming social bonds, leading towards group identity (Mithen, 2009).

Mithen defines musicality as, “communication using variations in pitch, rhythm, dynamics, and timbre, by a combination of the voice, body and material culture” (2009, p. 3). As our ancestors were highly emotional beings, music became the integral and essential expression of emotion until the birth of language, which became the predominant form of communication. Prelinguistic infants are receptive to music. Infants are able to detect changes in transposed melodies, notice tempo changes in tonal sequences, detect changes in musical intervals like the perfect fifth (a distance of seven semitones), process scale structures comprised of unequal steps, and detect rhythmic changes in tone sequences that maintain identical pitches. The most salient feature infants are able to detect is melodic contour; changes are noticeable when another melody is compared (Trehub, 2001).

During the process of hominization, bipedalism became a key evolutionary development, making an impact on music. The process of a hominid being able to walk

upright on two legs created an alignment of the head and spine, allowing for enhanced breathing and lengthening of the vocal tract due to the lowering of the larynx; both are beneficial in the creation of more sounds, as well as for breath management, which is particularly helpful in singing. The internal rhythms that were maintained from running and walking along with the freeing of the torso and upper limbs enforced muscular control that led to the ability to perform actions such as jumping, skipping, and twirling, a repertoire of physical movements allowing for the evolution of dance (Mithen, 2009).

Dissanayake (2000a) posits that the origins of music are observed in the vocal, facial, and gestural behaviors of the mother infant dyad. These vocalizations of shared emotions between mother and infant further encouraged *conjoinment*, which is the joint communicative interaction of imitation and sharing that produced “psychobiological brain states of interest and joy” (Dissanayake, 2000a, p. 390). The features of mother infant conversations include the prosodic nature of the mother’s voice as well as a variety in dynamics, timbre, and rhythm; such mother infant interactions engage both participants in an emotional narrative, thus providing an output of emotional expression (Dissanayake, 2000a, p. 404). From an infant’s first few months of life, the mother begins to engage in dialogue by speaking to her infant in a melodic higher pitched soft voice called, “motherese,” which can be accompanied by actions such as smiling, touching, cuddling, and rocking. The baby frequently gazes into the mother’s face and by about 2 months old, the baby can present a social smile. During the first six months, the mother gradually adjusts her vocalizations and facial expressions to a more exaggerated form and gradually leads towards more animated play. As the baby responds with broader smiles, movements, and various sounds of pleasure, the mother adjusts her emphasized moods,

movements, and tempo during this joint interaction. As mother and baby continue to imitate vocalizations and facial expressions, there is a sense of mutual enjoyment that is both natural and purposeful.

Dissanayake (2000a) postulated that these early interactions are musical in nature and stem from the emotional narrative created between mother and child. Such interactions are beneficial as they not only provide protection and care for the infant, but they affect attachment behavior during the first year of an infant's life. Sociocultural and psychological benefits include emotional regulation and support, modulation of the infant's states (i.e., soothe, alert, praise), exposure to meaningful sounds, acquaintance with the prosody of language for expressive reasons, and a sense of attunement and reciprocity within the dyad.

The idea of communication and play in infants and toddlers as a form of innate musicality is not new, as musical patterns are the integral force to human communication (Trevarthen & Malloch, 2002). Communicative musicality was defined in three dimensions: pulse, quality, and narrative (Malloch, 1999). These dimensions can be observed during early communication between the parent and infant. Motherese, or Infant-Directed Speech (IDS), is the melodic way in which a parent speaks to a baby. Newborns respond by gesturing and uttering, and "coo" sounds are used to match the pitch and quality of the adult. Adults in turn imitate the infant sounds and a two-way mirroring of expression takes place. Thus, "communicative musicality means to have, share, and affirm emotions" (Trevarthen & Malloch, 2002, p. 12).

Infants exhibit musical behaviors such as joyful calls, imitations of musical fragments, laughter, movements of the body, arms, and legs (Trevarthen & Malloch,

2002, p. 14), and by the middle of their first year of life, typically developing infants can collaborate rhythmically. From 6 to 9 months old, babies can exhibit pride in accomplishment as well as self-consciousness. At the age of one, they can begin to sing a melody, and it is at this time that teasing and movement games such as “peek-a-boo” are enjoyable and lends itself naturally to musical interaction.

Infant directed speech (IDS) is used with infants and preschoolers until about the age of three, as they have not yet attained full competency in language (Mithen, 2005). Adults communicate with infants in this manner due to the infants’ receptiveness to the exaggerated prosody well before they are able to fully comprehend words (Mithen, 2005). This musical way of speaking appears to be the source of communication that suggests that music has a developmental and perhaps evolutionary priority over language and that, “the neural networks for language are built upon or replicate those for music” (pp. 69-70).

Problem Statement

Attachment theory speaks to the importance of secure attachment between the child and caregiver and how it affects the child’s future relationships (Posada & Kaloustian, 2014). Primary caregivers and infants mutually engaging in responsive interactions leads to secure attachment, which in turn benefits infants in healthy social development (Bornstein & Tamis-LeMonda, 2014). These early sensitive dyadic interactions influence infants’ understanding of themselves and others, providing a social foundation for learning about their world. The importance of caring relationships in the early years of life is therefore foundational to healthy development and adaptation

(Shonkoff & Phillips, 2000). Infants can also form secure relationships with care teachers working in a childcare setting (Howes & Hamilton, 1993). Relationships with attuned care teachers benefit infants in that they can learn to self-regulate their emotions and behaviors, as well as begin to understand their peers (Elliot & Gonzales-Mena, 2011).

The co-construction of musical interactions between mother and child leads to shared emotional responses, as they become attuned to one another (Custodero & Johnson-Greene, 2008; Miall & Dissanayake, 2003; Stern, 2000). Music provides a pathway to connecting interpersonally with others, including peers (Bradley, 2009). The childcare setting is conducive to infants forming these relationships with their peers and care teachers (Recchia & Fincham, in press). Several studies have focused on the musical interactions between mother and infant (Gratier, 2000; Hsu, Fogel, & Cooper, 2000; Ilari, 2005; Malloch, 1999), within father-infant dyads, or in the triad of mother-father-infant (Addressi, 2009). Extending from the dyad to other family members provides additional social resources for interactions (Custodero & Johnson-Green, 2008, p. 35).

This study focused on how music functions for the infant room community as a whole. Within the community, parent-infant, teacher-infant, and peer-to-peer interactions were examined. Examining infants as they formed and built relationships with each other through musical expression provides a lens for understanding this unique communicative process. Emanating from my own need to be heard, I felt that in order to understand and *sympathize* with others who do not communicate with words, I had to listen for their voices through their music. Infants and young children naturally engage in music and initiate musical play, alone and with others. By attending to their voices, we might

discover how human beings come to know themselves and their world through music making, as listening to an individual's voice is to listen to their music.

Human beings are unique in that the use of the spoken voice distinguishes their species from others as well as differentiates one human and another (Loewy, 2004). Each voice has a unique color or timbre and when spoken, natural melodic and rhythmic patterns are encompassed in order to form a coherent phrase. Its use in communication, as expression or as response, extends to the singing voice and the body where emotions are conveyed through timbre, volume, articulation and accents or stresses embedded in the rhythm or melody of the music.

As a product of our evolutionary history, human beings are born inherently musical. Infants come into the world with musical agency. Thus, it is important to know how vocal sounds and physical movement are expressed as musical behaviors related to specific functions. Studies related to infant musical interactions have focused on caregiver-infant dyads, but have not looked beyond at a broader social context. This study was designed to explore how music functions for infants within adult dyadic relationships, within peer-to-peer interactions, and within the context of an infant room community in order to learn how to tend to the child's voice.

Purpose Statement

The purpose of this case study was to explore and understand the function of music in a community of infants. By observing the musical behaviors of infants in childcare and home settings, this study sought to gain new knowledge that can help

parents, caregivers, and educators better support and cultivate a musical space that fosters healthy infant development and wellbeing.

Definitions and Assumptions

In this study, I worked with and observed babies in an infant room setting located at a university-affiliated childcare center. In working with both teachers and parents throughout this study, infants were examined in the contexts of the classroom and home environments. Infants in this study were under the age of 2 years old. In addition to teacher interviews, a home visit took place during the parent interview, where I was able to observe most of the infants in their home environments.

Musical behaviors in this study were identified as sounds and movement responses to music, using, “variations in pitch, rhythm, dynamics, and timbre, by a combination of the voice, body and material culture” (Mithen, 2009, p. 3). This study focused on vocal and movement behaviors and identified vocalizations as the following: generic sounds, glissandi (ascending or descending slides between notes), musical vocalizations, sung and spoken syllables, sung words or phrases including a sequence of intervals (Tafari, Welch, & Hawkins, 2008). Musical vocalizations were defined as, “one or more sounds in tune on a vowel” (p. 60). Movement behaviors were identified as motor reactions (p. 74) to singing or to hearing music being played.

This study explored the musical behaviors of infants and the functions of their musicality and was based on the following assumptions and beliefs: (a) music bonds infants with others; (b) the human voice is an organic instrument and a medium for knowing self. Communicative Musicality (Trevarthen & Malloch, 2002) and Ellen

Dissanayake's psychobiological needs (2000b) will provide the theoretical lens through which I will study infant musicality. Foundational to these theories are the joint creations of musical interactions and shared emotional states between the caregiver and infant. It is through the early interplay between the melodic contours of a mother's voice and her infant's response that communicative musicality serves as a means of sharing emotions and making meaning from them (Dissanayake, 2000a). The use of motherese and the musical behaviors that children engage in affirm that the rhythmic and melodic natures of vocalization and movement are part of nonverbal communication (Trevarthen & Malloch, 2002). My assumption that music serves as a bond between the infant and others will take into account not only the adult to infant relationship, but also include peer relationships in the presence of, "intersubjectivity" that might be influenced by musical interactions (Trevarthen, 1993).

Plan of Research

The following research questions were used to examine the musical behaviors of infants, the role of adults, and the functions of musicality.

Research Questions

1. What are the ways in which infants are musical?
 - (a) What behaviors are considered vocal?
 - (b) What behaviors are considered movement?
2. What do parents and teachers report about infants by observing their music making?
 - (a) What do parents report regarding musical behaviors in the home?

- (b) What do teachers report regarding musical behaviors during music time and outside of music time?
 - (c) How do the musical behaviors of infants vary depending on whom they are with?
3. What function(s) do the musical behaviors serve?

Overview of Method

This research investigation comprises a case study of a community of infants younger than 2 years of age. As case study research lends itself to gaining a comprehensive understanding of the context involved and the meaning for those involved, studying infants in the classroom and outside of it relied on collecting multiple sources of data, in order to extract rich description to gain in-depth knowledge (Merriam, 1998). Data was collected through observations of these infants in the infant classroom, interviews with their teachers and their parents in the home environment, and by means of a document review which included parent and teacher diaries and relevant archival data from childcare and home settings. Participants were sought from a university affiliated childcare and research center. Additional data includes photos, videos, or artifacts related to the musical behaviors and interactions of these infants, field notes from general infant room observations, and observations of my own video recorded music time with the infants. This case study of the infant community will involve more than one unit of analysis, and the structure of this study will be open to different combinations of relationships that form within the community.

Delimitations

This study focuses on the musical behaviors of all infants whose parents granted permission situated in the infant room of the childcare center. The infant room of this childcare center covers an age range from two to 24 months old. Due to the individual nature of infants, parent beliefs and practices, and the differing philosophies of various childcare settings, this study and its results are not intended to represent all infants, childcare, or home settings.

Plan for Remaining Chapters

Chapter II of this document provides a review of literature covering the social development of babies, their musical behaviors, the roles that adults play in supporting infant musicality, and the functions of infant musical behaviors. Chapter III presents a detailed description of the methodology that was utilized for this study that includes an outline and description of the data collection, procedures, and the plan of analysis, as well as a summary of the pilot study that was conducted in the spring of 2016. Chapters IV and V represent the portraits for each infant. Chapter VI is a discussion of findings, and Chapter VII concludes with a summary of research findings, recommendations for future research, implications for music education, and a final reflection.

II – REVIEW OF LITERATURE

Overview

The purpose of this case study was to explore and understand the function of music in a community of infants. This chapter will cover four areas related to the research questions posed in Chapter I beginning with an introduction to the social development of infants as it relates to adults, peers, and the community. As musical behaviors of infants will be explored in this study, a description of vocalization and movement-related behaviors will be provided that focuses on how parents, caregivers, and teachers might play a role in infant musical development. Finally, the theories of Communicative Musicality (Trevarthen & Malloch, 2002) and its connection to the infant's psychobiological needs (Dissanayake, 2000b) are described within the context of function, and centered on communication, comfort, and exploration.

Infants and the Social World

Interactions between infants and parents are considered critical to development in the early years (Bornstein & Tamis-LeMonda, 2014). As infants are born ready to connect with others (Recchia & Fincham, in press), this review will examine their social interactions with parents and their care teachers, with their peers in childcare settings, and within a community context where the childcare center serves to connect child, family, and teachers.

Infants with Adults

The dyadic interactions of mother and child serve important functions for the child's social development, attachment and emotional behavior, as well as continuous progress towards communication (Bornstein & Tamis-LeMonda, 2014). By being sensitive to infant signals, parents provide quality care and in return the child becomes confident about parent availability and responsiveness (Posada & Kaloustian, 2014). These dyadic interactions serve in forming secure attachment behavior (Bowlby, 1973), where such behavior is indicative of attuned parents (Bornstein & Tamis-LeMonda, 2014). Since infants are equipped to communicate from birth, the parent-infant dyad share meaningful experiences and develop social understanding by exchanging behaviors that include coos, gazes, and smiles (p. 461); at the same time, children develop communicative skills, ultimately leading to language acquisition. These reciprocal, nonverbal interactions allow infants to decipher how their caregivers think while also providing them with emotional insight (Recchia & Fincham, in press), thereby helping the infants to develop skill in regulating their emotions (Bornstein & Tamis-LeMonda, 2014).

Infants engage in the act of play in order to explore their surroundings (Recchia & Fincham, in press). In a childcare environment surrounded by peers and teachers, the well-being of infants and toddlers is achievable through play, whether alone or with others (Seland, Sandseter, & Bratterud, 2015). The shared experience or, "intersubjectivity" (Trevarthen, 1993) begins as infants gain information from their dyadic experiences, affording them greater understanding of themselves and their partners (Bornstein & Tamis-LeMonda, 2014). Seland et al. (2015) explored the well-

being of 1- to 3-year-olds in a childcare setting. Through a qualitative approach, 18 children were observed. Results clearly showed that a child's well-being is gained when staff members provide a shared intersubjective space, where there is interaction with peers and teachers during play. Teachers attending to children's needs are thereby listening to children's voices while acknowledging that they are agents of their learning (Recchia & Fincham, in press; Seland et al., 2015).

In exploring the relationship of teachers and infants in an emergent curriculum childcare setting, Recchia and Shin (2012) videotaped infants and their care teachers in everyday social and communicative interactions. In this setting, teachers design activities that are child-centered, accommodating the interests of the child. The observations were done twice at six months apart. Teachers were either "in sync" or "out of sync" with their key child. When teachers met their infants' needs, a meaningful reciprocal relationship was achieved in the dyad. Teachers considered "out of sync" did not meet infant needs due to missed cues. Nonverbal cues included physical gestures, pointing, and direction of infant gaze (p. 1559). As each infant, no matter how close in age, is unique and has different needs, this study suggests that teachers should differentiate in order to meet each individual child's needs by actively responding to them and engaging in joint attention. Teachers who take infants' needs and interests into consideration establish synchrony by becoming observers of cues and acting as play facilitators (p. 1560).

Infants with Their Peers

While the responsive nature of a care-teacher can allow infants to have agency in their learning, infants' interactions with peers allow for subjective well-being through exploration and play (Seland et al., 2015), while furthering social-cognitive skills (Ross,

Vickar, & Perlman, 2014). Focusing on the second year of life, moving from an interest in self to an interest in others leads to coordinated joint engagement through peer interaction. Imitation, sharing, and conflict are all aspects of interpersonal interactions that involve the use of objects. Infants start to understand others' goals and intentions such as by offering and taking away objects according to peer response (p. 513). Socialization with peers also shows in how children can recognize themselves in a mirror, as well as distinguish between self and others. Infants as young as 9-months-old are willing to engage with others (p. 514). In a study exploring the signals and vocalizations of 19 infants from nine to 18 months of age during social games, Ross and Lollis (1987) prescribed games to these infants while observing their nonverbal behaviors. During the intervals, behaviors were observed between the adults participating in the game and stopping their participation with the infants. Infants vocalized to show they wished to continue the activity while also using gaze and pointing as other indicators. During the interrupted activity, infants engaged in more communicative behaviors, including more specific gestures like showing the object to the adult or even taking the adult's turn. This regulation of game behaviors displayed their capability and motivation to engage with others (Ross et al., 2014).

The childcare setting provides infants the possibility of developing friendships and benefitting from social interactions such as being involved in cooperative play and learning from their peers through imitation. This space allows infants to become prosocial through their peer interactions, as they learn to share and respond to the distress of others (Ross et al., 2014, p. 518). Learning occurs through peer conflict over possessions and this contributes to developing problem-solving skills, thus reinforcing

social cognitive benefits (Ross et al., 2014). In this case, teachers become transmitters of culture, as they facilitate how infants interact with others by encouraging the appropriate cultural values (Test, 2006).

Infants in Community

Extending beyond the dyad, the childcare center becomes an extended community for families, as parents look for external support in caring for their infants. Infants engaging with their peers in a childcare setting provides the benefits of well-being (Seland et al., 2015), and accommodates the need to belong (Recchia & Fincham, in press). The daily childcare activities that infants participate in, like taking walks, having meals together, and being part of circle time, all cultivate a space for belonging (McMullen et al., 2009). In providing responsive care, teachers benefit from relationship-building and working with parents in order to meet infant needs and to foster emotional security in infants (Rose, Kudela, & Cuppernell-Nolan, 2011).

Families are culturally diverse, so the interchange between the family and teachers provides feedback on important cultural values; teachers then have information to consider when assessing how to preserve these values as infants engage in social interactions (Test, 2006). Practices that address the diverse needs of the child-family-community (Recchia & Fincham, in press) provide meaningful experiences for all involved. In considering a community-centered approach, the child, family, and teachers are all active partners in shared understanding so that, “early care and education can serve as a bridge between teachers, children, and families” (“Concluding Thoughts and Future Directions,” para. 1).

Infants live in the social world and their development shows increasing levels of socialization. Typically developing infants become interested in people and exhibit alertness, gaze control, smiling, and cooing within their first few months. Their facial expressions take on animation, which is synchronized with the visual and physical interactions they are engaged in. From birth to 3 months, eye contact is the indicator of whether a child is making a connection with caregivers (Lock, 2004). During certain activities, for example, feeding, cuddling, talking, or rocking, infants might maintain eye contact for brief moments (Andrews & Summers, 2002). From 3 to 6 months, infants begin to smile when they recognize a familiar voice without having face-to-face contact.

Facial expressions, laughter, and gestures are further developed, and if a stranger attempts to interact with them, infants cry, fuss, or withdraw by reaching for the primary caregiver (p. 14). Lock described the period of 9 to 10 months as a time where communication truly begins as infants use their partners in achieving goals (2004). During the 9 to 12 month period, the child gains the attention of others by using movements, vocalizations, and specific behaviors in order to achieve a response from them. Repetition might be utilized in order to gain attention (Andrews & Summers, 2002). After the age of one, gestures and vocalizations are used socially to communicate and to reach out to others, get help, and gain attention.

Infants, Music, and the Social World

Two theories that contribute to how I will view infant musical behaviors in this study are the theory of communicative musicality (Malloch 1999; Trevarthen & Malloch, 2002) and Dissanayake's (2000b) five psychobiological needs. This section begins by

describing the co-creativity of the infant's and mother's musical interactions as, "communicative musicality," characterized by the parameters of *pulse*, *quality*, and *narrative* (Malloch & Trevarthen, 2009). A description of the psychobiological needs as part of the biological make-up of humans follows. The shared emotions expressed through infants', "rhythms and modes" (Dissanakaye, 2000b, p. 7) evolve through the five intrinsic needs: *mutuality*, *belonging*, *meaning*, *competence*, and *elaboration*.

Communicative Musicality

Communicative Musicality is described as the interaction of conversing emotionally with others through the use of music (Trevarthen & Malloch, 2002, p. 10). Human beings are born equipped to respond musically, despite the divergent cultures that exist (Trevarthen, 2000), and there is a need to communicate with others using the natural musicality inherent in all of us. The fact that infants have the ability to engage with parents and caregivers musically from birth is informative of their natural inclinations and sensitivity to musical sounds and gestures. In their musical conversations, babies mirror their mothers with feeling as they smile and coo and synchronize their movements to their mother's musicality while forming a shared experience (Trevarthen, 2000). Mothers reciprocate by expressing emotions with their use of motherese, touch, and movement as they engage in this turn-taking proto-conversation (Trevarthen 2000; Trevarthen & Malloch, 2002).

Three aspects of communicative musicality that make up a theory of motives are the *pulse*, *quality*, and *narrative*. *Pulse* is defined as the succession of behavioral steps through time linking the present to the past. In this dimension, pulse is maintained so that a subject can anticipate the action and the time of the occurrence. *Quality* refers to the

contours of the vocal and body gesture, shaped by expressive movement; contours are shaped by timbre, pitch, and volume in vocalizations or by direction and intensity in a given movement. *Narrative* refers to the individual experiences and companionship derived from jointly created gestures and built from units of pulse and quality as they are combined as chains of emotional expression (Trevarthen & Malloch, 2016, p. 3). The nonverbal form of communication enacted through body and voice are shareable moments made up of musical responses that are rhythmic in nature (Malloch & Trevarthen, 2009). Such responses allow mother and baby to be attuned to one another, while they share meaningful communication.

Psychobiological Needs

Dissanayake (2000b) describes the preverbal infant's, "rhythms and modes" that exist within the mother-infant dyadic interactions as, "intermingled movement and sensory overlapping" (p. 6). Infants are born with biological predispositions for engaging in emotional intimacy with others, and it is these psychobiological needs that are met by participation in the arts.

Mutuality. The intimate interactions between mother and baby consist of shared emotional states evident in the mother's vocalizations, facial expressions, gestures, and movements (Dissanayake, 2000b, p. 29). As the baby responds to the mother with sounds and movements of its own, both mother and baby enjoy this proto-conversation. This kind of baby talk, usually accompanied by the mother gazing into her baby's eyes, rocking, or patting, is pleasurable for both participants, as indicated by the mother's smile and the baby's mirroring sounds and emotion. The musical phrases of the mother's vocalizations are rhythmic and repetitive in nature, embodied in a softer dynamic, a

higher range, and the sing-song- manner of her voice. The face, especially the eyes, is an important feature, as it indicates both emotions and intention during the interaction. The combination of facial expression, vocalizations, and rhythmic movements of the body create a pattern that is processed as pleasurable emotions when shared by mother and baby. Dissanayake (2000b) calls this pattern of shared emotion and intention mutuality.

Mutuality can be communicated as praise, affectionate touching, or smiles and is required for human health from infancy through adulthood (p. 42). Imitation for infants communicates pleasure and harmony with others, which later becomes an important process of play for young children, as they learn how to adjust to their social environments. Mutuality was evident in studies involving functions of singing practices (Custodero, 2006), and this psychobiological need precedes attachment between the infant and mother making it vital for human development (Miall & Dissanayake, 2003). Interchangeable with *intersubjectivity*, mutuality is defined as, “the coordinating of behavioral-emotional states with another’s in temporally organized sequences” (Miall & Dissanayake, 2003, p. 352).

Belonging. Humans are born equipped to belong to a community where a sense of identity may take shape. Just as mutuality is important for attunement between a mother and infant, belonging to a group is also essential for human survival (Dissanayake, 2000b). From birth, babies naturally require mutuality and belonging as they seek affection, attention, and validation. The social traits that build a secure and sympathetic environment are developed within a group through rituals that include what Dissanayake (2000b) describes as rhythmic and modal elements (p. 60), in that mothers and infants display synchronization in their vocal and physical actions by imitating, matching, or

taking turns during their interactions. Deprived of the needs of both mutuality and belonging, they may develop into insecure human beings unable to form close relationships with others.

Finding and making meaning. Dissanayake (2000b) describes meaning as of biological importance in that babies respond to their mother's vocalizations, smiles, and actions in a positive way as part of feeling safe—feeling what is meaningful. Later on, as babies grow, they look to their elders for guidance as they make sense of the world and discover what is meaningful in it. Therefore, an infant is not predisposed from birth to make meaning, instead it is the predispositions for mutuality and belonging that help to construct meaning for the infants as they learn how to be in their particular environment. Human beings learn how to live in their world and with the people around them by developing systems, to learn the social skills. We pass down stories that evoke emotions through the use of imagery, music, and poetry; such traditions hold significance in our lives.

Hands-on competence. Grasping, poking, squeezing, and a multitude of other actions provide sensory information, and by taking hold of an object, infants process information orally by placing it in their mouths. Dissanayake (2000b) describes the use of hands as a way of knowing, as the physical act provides a pathway between the mind and body (p. 121). The act of touching provides information on emotions and intentions. We also find pleasure in handling objects because we are predisposed to be materially involved in the act of making. Taking on musical elements, infants gesture in synchronized rhythm with speed and intensity, as they emotionally communicate with caregivers. As babies grow and gain further control of their handling, they develop

coordination with their eyes and hands, and through play, children imitate others in order to understand and interact within their social environment. A baby's banging and vocalizing are synchronized, moving to the beat and enjoying the coordination of these modalities. The use of hands, can extend to express and communicate within a social context to connect and interact with others.

Elaboration. Dissanayake (2000b) describes five psychobiological needs that are inherent in all human beings. Babies are born seeking mutuality with their caregiver, belonging to a group, finding and making meaning in experiences, and competence through handling and making things with materials in the natural world (p. 129). These needs begin during infancy and last a lifetime. Starting from the preverbal stage of infancy, babies respond to music by engaging in play through movement, vocalization, and rhymes and chants. The rhythms and modes that reveal themselves through sound, facial expressions, and movements all tie together to make meaning as infants are involved in creating narratives with their caregivers. Through singing, dancing, poetry-making, storytelling, and dramatization, these musical features are eventually cultivated into art forms. These art forms are encoded with dynamics, repetition, accents, climax, and resolution in order to give emotional meaning to such compositions or performances. Through elaboration, the rhythms and modes of these art forms, become, "different from ordinary communication or behavior" (p. 130).

Adult Roles in Music with Infants

Musical interactions shared in an infant-adult dyad can further inspire communicative musicality. While parents can be responsive in adjusting their behaviors to meet the needs of their baby, teachers who work with infants may also benefit from

acknowledging infants as agents of their learning to further enhance communicative musicality (Custodero, 2009).

Reciprocity. Through music, infants and mothers share a connection in speech and song, making their experiences meaningful. Such relationships that begin with the mother-infant dyad are built through the vocal interactions and gestures that communicate the emotional experience shared between the two. Through their participation in musical dialogues, mother and child create a bond and share emotional messages so as to know each other and the world around them (Custodero, 2009). Custodero's (2009) collection of recorded episodes of spontaneous musical behaviors relates back to the shared meaning between adult and child as communicative musicality becomes evident in each memoir. The intimate nature of the musical space between adult and child lends itself to imitation, turn taking, and invitational gestures (Custodero, 2009; Custodero & Johnson-Green, 2008). Young children are naturally spontaneous in their music making when alone, though such acts are commonly interrupted by adults, as even focusing attention on the child disrupts their private musical space. While such interruptions might be well intentioned by the adult, for example, by praising him or her, it takes away from the child's private musical experience (Custodero, 2009).

The communicative musicality that occurs between infant and mother is illustrated by the improvisatory nature of their musical interactions (Custodero, 2009). There is a temporal structure between the receptive and responsive natures of both parties (p. 522). A survey given to parents of 4- and 6-month-old infants inquired as to why and how parents use music with their babies. In this study, Custodero and Johnson-Green (2008) posit that parents use music to support their infant as developmental changes

occur. It was the parents' role as observers of musical behaviors that allowed them to adjust their parenting accordingly, confirming the hypothesis that musical parenting looks different throughout the stages of infancy, given the developmental changes and the reciprocal nature of parent-infant interactions.

Custodero (2009) suggests that by visualizing and accepting learners as having agency in their own learning process, and adults being open and responsive to them, communicative musicality can flourish. The reciprocal nature of these interactions is evident in the mother-infant dyad during musical parenting (Custodero & Johnson-Green, 2008) and can be applied in teaching so that these teaching moments are meaningful. Communicative musicality is reciprocal, and it allows a teacher to respect learners and the musical space, which in turn is beneficial for the learners as well as the teacher (p. 525). Such an environment allows for musicality and, "surprise achievements" to emerge (p. 524). Custodero's (2009) accounts of two teachers being attentive to young children by observing, listening, and respecting private musical experiences revealed the reciprocal rewards that are afforded to both the learners and the teachers.

Parents as musical mentors. Infants' predispositions to music are evident in their musical abilities and interactions with their parents, indicating that parents are the first teachers that infants encounter. Babies prefer maternal singing and mothers instinctively respond to their babies musically, reflecting a biological basis for music (Trehub, 2001; Trehub 2002). Mothers use singing and infant-directed speech to communicate emotions to their babies and cater to their baby's musical interests as a way of musically mentoring (Ilari, 2009), adjusting their performances according to their baby's changing states (Trehub, 2002). In Ilari's (2005) study, mothers of infants

between 7 and 9 months old were interviewed in order to find out their beliefs on appropriate music for infants and uses of music with their babies. Findings indicate that the most salient mother-infant musical activity was singing, and the mother's role was that of musical agent. Mothers engage in various musical interactions with the ultimate goal of bonding and communicating with their baby, and factors such as the mother's culture, ethnicity, occupation, and language influence the ways in which mothers and babies engage musically.

Teachers as musical mediators and enhancers. Since mother-infant musical interactions are complex, practitioners in the early childhood setting should take the potential cultural circumstances of each case into account as they take on the role of, “mediators and enhancers” of these musical interactions. Early childhood music educators can extend musical practices from the classroom to the home by providing ideas that parents can implement (Ilari, 2009; Ilari, 2005). These ideas include musical experiences such as songs, games, movement activities (Ilari, 2009, p. 35), sound exploration activities, rhymes, imitative and collective singing, and the use of small instruments (Ilari, 2005, p. 658). Teachers can also enhance musical experiences by helping parents understand the importance of their singing and by cultivating a sense of comfort for parents to sing to their babies (Ilari, 2009). By learning about family practices, teachers can provide ways for parents to bond and communicate with their babies through musical interactions (Ilari, 2005), while stressing the importance of singing and valuing collaboration with parents (Custodero, 2006).

The Functions of Music for Infants

Children use music to communicate and express themselves to others, to comfort and entertain themselves, and to explore sounds through their vocalizations and their movements (Custodero, Cali, & Diaz-Donoso, 2016; Pond, 1980; Shimada, 2012). Given that the musical predispositions of rhythms and modes are present from birth (Dissanayake, 2000b), infants are born ready to communicate. Through their musical interactions, infants secure their relationship with their primary caregiver through the mutual sharing of emotions (Dissanayake, 2000b). Mutuality sets the foundation for later experiences and relationships with others. By taking part in everyday life, their intrinsic needs for belonging, finding meaning, developing competence, and elaborating on said competences (p. 7) become evident in how their musical behaviors serve them as human beings.

Music for Communication

During the pre-linguistic stage, infants are equipped to communicate before language and reasoning are taught to them. During the first year of development, the mother-infant dyad becomes the main focus, as babies interact with their mothers' musical speech and lively play.¹The rhythmic patterns and melodic contours of Infant Directed Speech (IDS) help to bond the dyad in the first few months, as a narrative form between mother and child through their proto-conversations. The pair is involved in musical play during action games, joyful calls, body movements, and imitation that help to prepare babies to collaborate with others in rhythmic games by the middle of the first

¹ This refers to typically healthy parent-child interactions, which may be disrupted by other circumstances such as maternal depression, or neglect.

year (Trevarthen & Malloch, 2002). As the prosodic characteristics of IDS between the mother-infant dyad predominate during the first year of an infant's life vocalization and singing become the fundamental method of communication. Vocal sounds during the infant's first few months are usually involved in vocal play and these musical sounds help shape the prosody of speech (Papousek, H., 1996; Welch, 2005).

While crying is the first communicative act in relating discomfort or distress, by 3 to 4 months of age infants can imitate the rhythmic and melodic features comprising the exaggerated pitch contours of their mother (Masataka, 1992). Because neonates are sensitive to their mother's sounds (Welch, 2005), by age one, babies are able to babble according to their specific cultural background since they are tuned in to their mother's language (Meltzoff, 2002).

To examine the musical practices and beliefs of parents, the Parents' Use of Music with Infants Survey (PUMIS) was administered to parents of 4- to 6-month-old babies (Custodero, Britto, & Xin, 2002). A series of classical music CDs were distributed to new mothers in hospitals and doctors' offices. The first phase of this research project consisted of telephone interviews with 2,250 English-speaking parents who had 4- to 6-month-old babies. Preliminary findings reported that two-thirds of the parents sang and played music for their babies every day. They noticed that their babies exhibited active responses by smiling, moving their limbs, and becoming more attentive. Thus, parents in this survey considered music to be a communicative tool.

The emotional communication that is shared in the mother-infant dyad occurs in the form of, "baby talk" in the infant's first six months (Miall & Dissanayake, 2003). Examining the poetic structure of the mother's baby talk in a conversation lasting for one

minute with an 8-week-old infant, there were elements such as repetition and exaggerations in vocal and physical mannerisms, with musical features such as phrasing, pacing, changes in rhythm, applying musical form as part of the emotional conversations (p. 356). Building on Bowlby's (1969) attachment theory that infant responses to separation from their mothers have an impact on social development and that babies have a need for attachment, this study suggests that infant responses to the poetic nature of their mother's speech can be detected soon after birth.

Singing for communication purposes can be both intra-personal and inter-personal. Music is experienced intra-personally, as infants experience the acoustical sounds that are relayed back to them during early melodic vocalizations and vocal play (Welch, 2005). The interactive nature of vocal play between infant and parent, for example, make up inter-personal communication (Papousek, M., 1996), and as these skills develop, a shift takes place from intra-personal to inter-personal communication, as the infant is becoming socially aware (Welch, 2005). Children are able to use music as a communicative tool acting as both creators and recipients (Campbell, 2010).

Since research has been focused on the mother-infant dyad and its relationship to attunement and secure attachment, Bradley (2009) chose to observe babies during the sound-making process as a collective group, due to the lack of studies focusing on the dynamics of intersubjective attractions between infants (p. 269). Bradley looked at babies in trios and their music making during vocalizations that matched the attractions that developed between the babies. Three infants between 6 and 9 months of age who were unknown to each other sat in strollers and were placed in a recording studio. They were placed in an equilateral triangle within foot-touching distance. Two digital cameras

recorded the interactions while the mothers and experimenter were watching from the next room on a monitor. There were 15 trios, with each session averaging 12 minutes in length. The session ceased if their mothers or the experimenter noticed a baby was either bored or frustrated.

Data consisted of two important elements: vocalizations and gaze, being the indicator of preference. Bradley presented findings from two trios: the “Red Hat Trio” and the “Cats’ Chorus Trio.” A vocalization consisted of voiced sounds like coughing or crying. Vocal sounds were deemed “musical” if they were considered attractive to the ear with complex changes of pitch. The sounds were coded as “directed” if they were accompanied within three seconds with one or more looks to the same person.

The Red Hat Trio had a dominant infant who initiated several groupings of staccato “ah” sounds, mostly directed at one other infant. The two infants receiving these vocals often vocalized it in the same style or echoed the rhythm of the vocal sound. The Cat’s Chorus Trio performed a, “symphonic sequence of synchronous vocals” (p. 275) for over two minutes. In examining how babies’ spontaneous communication is musical, this study concluded that looking at these spontaneous sounds from infant-only groups can provide a different perspective on the origins of musicality, and that there is a relationship between music-making and attraction to sound-making.

As indicated in the baby talk between a mother and an 8-week-old infant (Maill & Dissanayake, 2003), the poetry of maternal speech displays melodic contours and rhythmic patterns necessary for bonding in the first few months of life. Moving from the dyad to peer-to-peer interpersonal communication, Bradley (2009) extended the dyadic paradigm to infant trios and their musical communication with each other.

The emotional sharing between the mother-infant dyad during the early months of an infant's life is indicative of the need for mutuality present in the interpersonal communication and bonding practices (Maill & Dissanayake, 2003). The dyadic interactions that precede attachment stress the importance of this practice as it has implications for the infant's social development later in life.

Music for Comfort

Just as infants are able to regulate physical functions such as heartbeat, sucking, or breathing, they are also naturally inclined to regulate the experiences they are exposed to (Shonkoff & Phillips, 2000). Infants and young children build relationships through a process of attunement with their caregivers, and based on the trust and security of this relationship, children learn to adjust their emotions and behaviors healthfully while adapting to various situations (Elliot & Gonzales-Mena, 2011).

In viewing the musical behaviors of children as an act of transitional practice, Custodero, Calì, and Diaz-Donoso (2016) investigated the self-initiated music making of children as a cultural tool that they use in order learn and make sense of their surroundings. In this study, the child engaged in musical behaviors for comfort frequently when they were alone in solitary social contexts. The subway lines in New York City served as the setting for the spontaneous music making of children, and through the observed musical behaviors and materials of children, interpretations of the environment, behaviors, and possible functions of said behaviors were explored. Data were collected on children from ages two to ten over a period of three weekends on two subway lines. Equipped with the "Spontaneous Music Observational Protocol," groups of seven to ten observers split into groups of two or three and recorded the music making episodes they

witnessed. Field observers recorded the musical quality, context, and sources of each episode, which were later used to form narratives for each case.

From the 69 episodes that were documented, three types of social contexts of musical behaviors were noted: solitary, cooperative, and parallel. Over half of the episodes involved solitary interaction, and the most frequent functions of the musical behaviors were for comfort and entertainment. Most of the observed behaviors were invented and 81% of the episodes consisted of vocal behaviors. The researchers noted that when adults interacted with the child during music making, whether by hushing the child in the train or by acknowledging the behavior, the music behaviors of children ceased.

The solitary period at bedtime is an important time for toddlers, where they are free from adult caregivers and sibling interactions. In examining the spontaneous vocalizations of nine toddlers from the ages of 18-36 months from eight families, Sole (2016) sought to understand the developmental function of these private musical behaviors. In this study, parents became co-researchers by providing descriptions of the behavior and details of the context from which their toddler's spontaneous singing arose. Parents stood outside their child's room and filled out the Parent Observation Reflection Form (PORF) with what they heard, and they also collected audio samples from inside their child's bedroom using a voice recorder.

Sole (2016) developed a coding scheme for the descriptions of sounds made by the parents and the researcher. The study revealed that many of the toddlers created and repeated their spontaneous songs as a way to make meaning of their world as they experimented, reflected, and self-soothed. Such solitary musical behavior allowed them

to self-soothe and ease into transitions, in this case from being, “together to alone” (p. 12). A 26-month-old infant sang through a variety of learned tunes with a bottle of water, providing dynamic variety to her musical motives by altering the tempo, using different pitch registers, humming with what sounded like her mouth being closed around the bottle. Her mother believed that this must be comforting for her daughter as she moved from tune to tune as a way to relax into sleep, all the while feeling vibrations throughout her body.

Addressi’s (2009) study on music making during daily routines focused on children under 4 years old. During bedtime observations, seven children from ages 13 to 19 months were filmed before going to sleep at a nursery school, with each child in their own bed, free to vocalize. During this pre-sleep period, they found that children engaged in interesting vocalizations. A young girl engaged in “autotelic” vocal play, where the motivation is focused on the act itself. She sang a repeated descending melodic pattern right before closing her eyes to sleep. They also found that children engaged in imitative vocalizations with their peers, elaborating on the vocal sound that emerged. It started out with a cry from one child, which was then altered by other children as they “threw the sounds” back and forth, varying the original vocalization (p. 759).

These studies point out that children are predisposed to music, and music making provides them with tools to use throughout their development, providing comfort during transitional moments, whether from the familiar to a less familiar environment (Custodero et al., 2016) or from being with others to being alone (Sole, 2016). When the surroundings of the child support the child’s sense of agency, children become active participants in their own development as they explore their world, and the result is that

the child's motivation swells (Shonkoff & Phillips, 2000). Children's musical predisposition provides the sense of agency (Custodero et al., 2016), and as music is imperative for development, it is important to provide the space and support for these musical behaviors.

Exploring the musical interactions between mother and baby, Ilari (2009) conducted a study involving three women and their children. Through semi-structured interviews, field notes, and parent diaries, narratives were constructed for each case describing the musical aspects that were found. This study explored the musical repertoire used between mother and infant, the musical ways in which they interacted, and their functions. The musical interactions included the mother's use of motherese, proto-conversations, songs, and rhymes. In one home, the interpretation of the mother's use of music was to entertain and to calm her children. The mother intuitively rocked and sang to calm her child. Another mother used a preferred song to provide a safe environment for herself and her child in order to form a secure attachment. The findings from this study suggested that these musical interactions helped to provide a sense of belonging for the baby during these early years of life (p. 34).

Music for Exploration

Young children's natural musicality is deeply rooted in their being and free exploratory play allows for their musicality to emerge (Pond, 1980). Daniel Pond served as the music director from 1937-1944 at the Pillsbury Foundation School where he collected data on 3- to 6-year-old children who were enrolled in the school. The purpose of establishing this school was to observe the spontaneous creativity and musicality of young children; they were provided the freedom to participate in activities including

riding bicycles or in wagons, running, dancing, playing instruments, and singing. With access to a wide variety of musical instruments, the Pillsbury Project's aim was to observe children during free play activities, and to "discover how creative music activity was provoked and generated in young children" (p. 40). From his observations, Pond concluded that when children became aware of sounds, exploration within their environment began where they found enjoyment and delight that transformed into child-created sound shapes. These shapes, including both instrument playing and vocalizations, resembled wave-like movements due to the repeated patterns of their sound shapes. Young children delight in their sound making, and Pond confirmed the importance of free exploratory play and the nurturing of young children's inherited musicality for healthy development.

Vocalizations of infants, when alone, were found to be closely related to play behavior as they were produced spontaneously and voluntarily. Shimada (2012) hypothesized that infants vocalized to listen to their sounds when they were alone and comfortable and not for the purpose of calling for a response from others. In order to test this hypothesis, this study observed infants during vocalizations when alone and when interacting with others. During this experimental study, three conditions were applied: (a) the response condition where the mother responded to the infant; (b) the no-response condition where infants were left alone in a room and spontaneous sounds commenced; and (c) the no-response-amplified condition where infants were left alone in a room and the infant sounds were transmitted from a recorder and heard through speakers in order to provide real-time feedback for the infants to experience. Shimada's rationale for providing acoustical feedback in the third experimental condition was based on the

enjoyment of the baby's sound. If babies enjoyed the sounds of their voices, they would continue to vocalize; if the purpose of their sound were not for sound feedback, their behavior would cease or change upon hearing the unexpected feedback.

In both conditions where infants were alone, phrase repetition was more frequent, and overall the ratio of sound was higher in the no-response-amplified condition than in the no-response condition or with the response condition. Shimada concluded that infants produced sounds continuously when no interactions were involved, and the repetition of phrases during solitude suggested a basic element of music behavior, that they create and hear their sounds as exploratory sound play. This is distinct from calling behavior, for example crying or fussing, in order to elicit a response in an uncomfortable situation. This study suggests that infants play with their sounds and auditory feedback might provide benefits in phonological development.

Infants and young children explore sounds through their vocalizations and manipulation of objects, as a way to engage in music. Pond's (1980) observations provided insight into children's delight and pleasure in newly constructed vocal and instrumental musical creations, thus stressing the importance of gaining competence through exploration and play. Just as infants enjoy solitary play experienced through vocalizations (Shimada, 2012), their repetitive babbling while banging on an object is also reminiscent of inherent delight in handling objects and exploring sounds (Dissanayake, 2000b, p. 104).

The interactions of the caregiver-infant mutuality combined with art create an elaborative experience, one that is different from the ordinary (Dissanayake, 2000b, p. 130). The ritualistic nature of these interactions leads towards repetitive vocalization and

movement in a similar structure to those of musical forms such as song and dance (Dissanayake, 2000b). Along with repetition, musical elements are applied such as accents, theme and variation, anticipation, synchronization, antiphony, and these rituals may build up to a climax and resolve (p. 142). Dissanayake's idea of using music to, "make special" the everyday lives of people, for example, has been found in family routines (Custodero, 2006). A study on singing practices in families and young children examined the types of singing used and the purposes they serve. Data collection consisted of parent interviews, observations of their children, and parent journals. Routines and rituals incorporating music were a part of daily life for families, and singing for most of these families elaborated on the daily experience, making it different from the ordinary. Most of the families used music to make these everyday routines special (Custodero, 2006, p. 52), indicating that these elaborative rituals can be an enjoyable experience that provide emotional satisfaction (Dissanayake, 2000b, p. 143).

Communicative musicality (via *pulse*, *quality*, and *narrative*) gives voice to preverbal infants as they engage in proto-conversations through modes of communication other than speech. Mother and baby use communicative musicality to engage in mutual bonding. Comfort is attained when music is used as part of self-regulation or transition as the baby builds a sense of belonging with others as they adapt to their environment. Babies and children explore through play as they take in information from the natural world in order to gain knowledge and to become competent in the world through handling and making, as they find and make meaning. Through elaboration, the functions of music and psychobiological needs come together, culminating in the arts, essential to human life and well-being.

Music Behaviors in Infancy

Infants begin to develop self-consciousness in performance during their first year, and display a sense of pride in their abilities. By age one, they begin to sing melodies with accurate control of pitch and can practice musical fragments with their voices or with instruments (Trevarthen & Malloch, 2002, p. 15). After the age of one, they begin to imitate vocal or rhythmic lines, using their body movements to show pleasure in music. With their peers, toddlers begin to engage in joint expression, as they become aware of the spontaneous inventions of their music-making as part of a musical community. What follows is a classification of vocalizations and movement as musical behaviors. In reviewing the musical behaviors of infants, I begin with a brief description of the preverbal infant and the musical behaviors that encompass their vocalizations and movement. By engaging in reciprocal interactions with infants, adults can play roles in infants' lives to enhance musical experiences.

Vocalizations

Through a Musical Stages of Speech model, Loewy (1995) describes three stages of preverbal vocalizations developed from clinical experiences to benefit children with diverse needs. In stage I, crying and comfort sounds are the markers describing a child's first vocal expression at birth, the crying sound, where functions of tone and air are explored, providing reflexive motoric release (p. 51). Infant cries are reflexive actions that indicate basic needs. Comfort sounds include gurgles, sighs, and coos, which are percussive in nature enabling rhythmic breathing patterns. During this stage, pitch patterns rise and then fall. Stage II includes babbling, lalling, and inflected vocal play,

where children experiment with prosody, shaping their musical contour, which is the earliest formation of linguistic communication. The babbling stage at its beginning is described as solo cries which seem to develop organization and frequent rhythmic patterns. Through babbling, children are able to control and express needs through a greater sense of interaction. Loewy labels stage III as single and double word utterances, where the child's first words are understood and expressed. Loewy suggested incorporating familiar melodic contexts as the child vocally explores sounds to enhance their sense of music making (1995).

Through maternal acoustical interaction, the infant's vocal production is shaped as parents sing and speak using a variety of pitch levels, range, and tempi (Welch, 2006). The earliest vocal behavior is crying, followed by cooing, musical babbling, imitation, and vocal play. Thus, an infant's vocalizations during the first year of life communicate affective states (discomfort, distress, comfort, eustress), as well as quasi-melodic features at 2-4 months, and vocal control and pitch at 4-7 months, resembling the mother's own speech prosody (Welch, 2006, p. 314).

During the final months of gestation, the fetus is able to hear the mother's melodious tones, shaping the emotional experiences through these foundational moments of singing development (Welch, 2006). In examining singing behaviors in infants, a longitudinal study was designed to gather information on musical development from the final months of prenatal life, where hearing begins for the fetus, through the first six years of life. Describing the musical development from age zero to age three, the first vocalizations include crying, wailing, or whimpering in order to communicate needs (Tafari et al., 2008). By 3 months of age, infants are able to respond to their mothers'

instinctive higher pitched vocalizations by taking turns during these proto-conversations. Throughout the vocal development stages, infants begin with simple sounds from the first few months of life and by about 4 to 6 months, babies explore their sounds by adding in different sounds and repeating them (Papousek, M., 1996). During the first two years of life, vocalizations may sound like songs due to the elongated vowel sounds that may take on a rhythmic shape with or without sung syllables. At times, these songs begin to resemble fragments of familiar songs, or, “spontaneous songs” (Tafari, et al., 2008, p. 15).

Tafari et al.’s longitudinal study focused on whether, given the stimulus, environment, and strategies, children can sing in tune if they are given this opportunity from birth. Through imitative song, where songs are learned through imitation, children are able to replicate ascending/descending contours, and later intervals, where they become recognizable (Davidson, 1985; Tafari et al., 2008). From five months onwards, infants enjoy exploring making noise by playing with instruments, clapping their hands, and by bouncing. As babies’ skills progress, for example grasping or walking, so does their music making. By 4 to 6 months they are able to play with shakers, drums, and from one year onwards, babies can repeat syllables and words of songs (Tafari et al., 2008, p. 37).

The first vocal sounds a baby makes are crying and screaming where the baby makes the connection between the call and the need being met. In recording the vocal sounds that infants make, sounds were classified as generic sounds, glissandi, and intervals (Tafari et al., 2008, p. 53; Tafari & Villa, 2002). Ascending and descending glissandi were apparent from 2 months of age, and singing intervals were more frequently

heard from 6-8 months of age. At the end of the study, Tafuri et al. (2008) concluded by identifying five types of vocal production: musical vocalizations, syllables and words spoken with rhythm, sung syllables, sung words, and sung phrases (p. 61). Musical vocalizations were defined as vowel sounds that are in tune comprising either one sound on each pitch, or a lengthier sequence of six to 10 sounds (p. 60). This study affirmed that by 18 months, the first phrases were sung in tune. Moog (1976) in his observations of children singing and parent comments describe infants as, “crowing” or chuckling, and babbling along to music to voice pleasure (p. 40). Moog (1976) differentiates babbling for speech at 2 months of age to that of musical babbling at 6 months of age where sounds vary in pitch encompassing a single vowel or a few syllables (p. 40). On the other hand, babies who have been exposed to music a few months before birth and onwards are able to musically babble at an earlier stage (Tafuri et al., 2008).

Movement

From 6 to 9 months, typically developing infant actions suggest that they are performing an action in order to achieve a result, and by 9 to 12 months, infants become more deliberate in their actions (Lock, 2004), where gestures are connected to their environmental context, and the act of pointing is developed and used at approximately 12 months of age. During this same time period, infants will roll or crawl in response to familiar people and stimuli (Andrews & Summers, 2002).

Infants rock, play, bounce, clap hands, and play instruments freely while exhibiting pleasure at the same time as they work on their emotional and motor development and sense of time (Tafuri et al., 2008). From 3 to 4 months of age, babies respond to music physically while it is being played or to the sound of their mother’s

singing. A response to music begins at the baby's first smile (Moog, 1976) at 3 to 4 months (Tafari et al., 2008) where, along with the movement of arms and legs, a motor response is demonstrated. Music can both rouse and calm an infant (Moog, 1976; Tafari et al., 2008), and can elicit an emotional response by 6 months of age, which has more to do with a response to an aesthetic stimulus rather than the meeting of a physiological need (Moog, 1976). With clear bodily movements that repeat, babies are able to respond to, or match, the rhythms and dynamics they hear. By 9 months, babies are active in their music responses and by 18 months, when standing and walking become part of their movement repertoire, babies share their responses by dancing with a partner, which could include a doll (Moog, 1976).

Kenney (2008) summarizes various ways in which musical behaviors can be nurtured by parents and caregivers. The musical behaviors are categorized by age, followed by suggestions of how adults can promote learning. From birth to 3 months, babies are calmed by music, can discriminate between two pitches, hear melodic and rhythmic structure, babble in response to singing and listening to music, match pitch and contour, and exhibit pleasure in self-created sounds (p. 3). From 3 to 8 months, babies can hit, kick or shake objects to create sound, bounce in order to signal to adults to repeat a bouncing song or chant, join in singing, show preferences for music, imitate rhythmic movement responses to music, engage in vocal play, and before age one they know songs before they can sing them. From 8 to 18 months, babies can imitate what is heard, attempt to match movements to music, have more variety in movements, be more self-expressive, begin to run, enjoy playing with extremes in dynamic levels, explore sounds,

are driven by motor energy, and developing a sense of awareness of past and future, where memory making allows for song acquisition (pp. 4-5).

Conclusion

In their social world, infants develop relationships with others and within a community, and researchers have acknowledged and provided tools to understand how music enhances those relationships. Working with concepts such as Communicative Musicality and Dissanayake's psychobiological needs, I explored the relationship between music and the individual. In considering the individual as an active agent of their learning, I looked deeply into a community of infants to examine how music functions for them based on these theories.

III - METHODOLOGY

Overview

The purpose of this case study was to explore and understand the function of music in a community of infants. This study aimed to describe the ways in which infants are musical, the possible functions of said musicality, and how parents and teachers perceive these behaviors. As I was interested in making discoveries and interpretations throughout this study, a case study approach was used in which the infant community as a whole served as the participant (Merriam, 1998). This community consisted of the infants, their families, and caregivers at a childcare center. Data was collected through systematic observations of the infants, and through semi-structured interviews with parents and teachers. Additional data was collected through the implementation of parent diaries, teacher diaries, and any relevant document review obtained from the early childhood center and from parents. This study involved infants under 2 years of age attending three or more days per week at a university-affiliated childcare facility.

In this chapter, I outline the research design of this study and review results from a pilot study that I conducted in the spring of 2016. An overview of the research approach and a description of my role as researcher are provided; the participants and setting, instrumentation, data collection and procedures, and plan of analysis are explained in detail.

Research Approach

A qualitative approach was utilized through a case study design in order to understand the situation thoroughly by focusing on the infant classroom setting as a context in the community (Merriam, 1998). As the research questions relate to how an infant community uses music and how teachers and parents perceive these musical behaviors and their functions in the classroom and at home, the explanatory nature of these questions implies case study as the ideal method, as case studies, “deal with operational links needing to be traced over time, rather than mere frequencies or incidence” (Yin, 2009, p. 9). Through the use of interviews, observations, document review, and parent and teacher diaries, I explored over the course of a semester how musical behaviors were defined and interpreted by the parents and teachers of the infants and considered my own perceptions as well.

A semi-structured interview protocol was appropriate for this study, due to the varied nature of each individual’s culture, traditions, and interpretation of what constitutes music behavior. By examining the lived experiences of teachers and parents, interviews allowed the participants to reflect and make meaning of their experiences (Seidman, 2013). The shared stories and experiences of the music teachers and parents alluded to connections between infant musical behaviors and meaning making or function. A semi-structured interview allowed space and time for interviewees to express their thoughts by relating their experiences and observations; this built rapport with the interviewee and created an environment wherein participants felt free to disclose their authentic selves through their detailed responses (Alvesson, 2010). By comparing the

participants' stories, this study aimed to find differences and similarities between observed and performed musical behaviors by infants.

Through the use of portraiture, I interpreted the experiences and perspectives of others in order to capture the rich and complex nature of human experiences (Lawrence-Lightfoot & Davis, 1997). As the portraitist, I created a narrative, drawing upon the importance of contextual information, so as to observe, record, and interpret the meaning of formed relationships. The community would be identified through the relationships of infants-to-infants and infants-to-adults. It is expected that these portraits would vary and change over time throughout this study. By providing a detailed profile of infant relationships, such as duets or trios, descriptions and interpretations of these relationships (Merriam, 1998) will serve as units of analysis. Looking within and between the relationships, descriptions of these portraits include an interpretation of the infant's role and relationship with teachers, parents, and the researcher, how adults perceive and use singing and/or music in the classroom or at home, and how they define or identify singing and musical behaviors.

Interviews were conducted with the head teachers and graduate assistants of the infant classroom. Parents were interviewed once during a home visit so that I had an opportunity to acquire information on environmental factors that contributed to the musical space involved in the data collection, as well as observe the interactions between the parent(s) and the child, when possible. The home visit offered insights into any contributions from home that the child brought into the classroom. Parents also informed me on what the child brought home from the classroom. By comparing their stories, I explore differences and similarities between perspectives, goals, and practices in the

different contexts and settings. A second interview for head teachers provided an opportunity for clarification of aspects of the previous interview, new questions that arose from the first interview data analysis, and time for the teachers to discuss items listed in their diaries. The second interview included similar questions to the first interview in order to investigate any changes that arose due to the infant's developmental growth.

An observation protocol was used to analyze the vocal sounds and movements made by the infants in the classroom. Systematic observations were conducted on a weekly basis for approximately 2-4 hours per week beginning the first week of data collection. These observations allowed me to witness the musical behaviors that took place, as well as how music was used in the classroom and whether those actions were infant- or adult-initiated. By observing infants in the natural setting both at school and once at home, an intimate familiarity with the situation could be attained (Merriam, 1998). Field notes included verbal exchanges between all individuals in the infant room, including the teachers, as well as practices that occurred in the classroom, and connections between the two (Berg & Lune, 2012). Weekly infant music classes were video recorded by either myself, my fieldwork music students who worked in the infant room with me, or other teachers in the infant room, documenting my presence as a participant and facilitator.

Archival documentation was used for background information on the philosophy and practice at the childcare center. Analyzing articles from conferences related to the center and literature that is given to parents gave insight into the emergent curriculum and structure of the center, providing contextual information for this study. Teachers and parents who wished to share memos from *LifeCubby*, an online application where

observational notes were sent each day from classroom teachers to the parents of the infants, were encouraged to do so if they felt there was any relevant information. These daily reports served as supplemental data if clarification was needed and are not vital to the study. These private archival records are intended for smaller audiences, in this case the staff and parents of the case study, where memos might reveal the definition or interpretation of a given situation (Berg & Lune, 2012). Throughout the course of this study, I did not receive these memos; instead I occasionally received artifacts in the form of photos, videos, text messages, and emails. Thus, document review included any other written records, artifacts, photos, and videos provided by the center or parents. These sources supplemented the interviews and observations by providing descriptive and rich contextual information (Merriam, 1998).

During the three weeks of this study, parents and teachers were asked to record any observed behaviors of infants that they considered musical. A diary template was provided to them, which recorded the date, time, description of the musical activity, and any other relevant information they wished to share. Diary entries commenced after the first round of interviews, and participants were asked to record their entries using voice recorders for ease and convenience, by writing/typing into a WORD template, or through a Google document I created for each adult participant. This diary would reveal what parents and teachers consider as musical behavior, as well as provide a view of how musical activities were integrated or initiated at home and in the classroom. As informants, parents and teachers reflected on their own performance, as well as that of the infants, providing further insights into the episode (Berg & Lune, 2012). This diary also

provided a cultural perspective of how music was being used in the household and what resources were available to the infant in relation to cultural traditions and practices.

Researcher Role

As a performing artist, there exists a truth that is present when I am truly engaged in the moment of performance, and there are no words to precisely depict the inner happenings of the mind and body during those moments. On the surface, I can describe it as an awareness of sound and colors meshing together in order to form a transportable energetic yet serene force acting as a communicative thought or emotion that transmits from me to others open to a shared musical space and experience.

As a teacher I have worked with children and young adults in a K-12 setting, and I have learned that music for these students represents a form of prideful musical expression, communicating the essence of an individual. In returning to New York City after several years in Germany, I worked at a school in the Bronx serving students in grades K-8 and I informally surveyed a discussion based on why music was important for them. A few common themes expressed by these students included: “Music calms me,” “I feel better with music,” “I can feel with music,” “It makes me happy,” “I can free myself,” and “It helps me when I am in any kind of mood.” While it seemed apparent to me that these students found comfort in music, they also found a mode for expression, communication, and exploration of identity.

When I began my doctoral studies at Teachers College, I was very interested in the effects of group singing on victims of stroke who suffered from Broca’s aphasia. I observed stroke patients in a group singing setting and conducted a pilot study on the

effects of group singing on individuals with this disorder. It seems that the power of music not only helped with speech, but the act of group singing provided them a mode of expression, a *voice*, which enabled them to emotionally connect with their inner being, allowing them to find themselves again. Working in an environment with developmentally challenged adults, where the range of disabilities is vast, I find that the individuals are able to find their *voice* as they form connections within a musical activity or the musical context of our meetings.

The experiences I have described transform the voiceless moment to one of power. Music serves as a portal to improving other areas of development for individuals. Music is an independent and thriving art form that stands strongly on its own in the development of human beings, instead of only acting as a bridge to enhancing another skill. I argue that music is an integral force that exists from birth, if not before, as a way to communicate, soothe, express emotion, and explore the world around us and at a later stage of development can shape language.

As an observer, participant, facilitator, and musician, I conducted this study using a qualitative approach through a case study design in the infant classroom setting. My biases include the belief that music is inherent in individuals, and I believe it is a form of communication that comes before spoken language. Others may not take this same point of view or may not yet have considered it. Therefore, there was a need to carefully consider the form and delivery of my interview questions, without suggesting my own beliefs or influencing participants. Second, I found that video recording my own music classes with the infants became a useful tool for analysis. As a music instructor, I was able to capture musical behaviors and expressions I may have missed in the moment; as a

researcher, I would be able to reassess recorded behaviors as needed. Third, when taking functions of musical behavior into consideration, I strove to address the challenge of overcoming my initial assumptions. Having enough data to revisit, check, and clarify helped to better understand specific musical behaviors.

Pilot Study

A pilot study was conducted during the spring of 2016, focusing on one female infant who was 14-months-old at the start of the study. Data were collected in the following sequence: interviews, formal observations, a focus group, and archival data. Participants for the interview consisted of two graduate assistant infant room teachers and the mother of the infant. The focus group consisted of three practicum student teachers and a fieldwork music student who routinely came into the infant room classes with me.

Aside from the two formal observations intended for the pilot study, I had been observing the infant classroom on a regular basis before this pilot study began, and it helped me choose the infant who might be appropriate for the case study. These initial experiences gave me insights about how to assess the data from my case-study interviews. Observing before the study began gave me a better idea of *how* and *whom* to observe, and the two formal observations that took place after the interviews allowed me to focus on *what* to observe. The focus group that took place after the interview and observation sessions worked well, as it confirmed and offered clarification on interview data and the structure of the infant classroom. It offered insight into and extension of key themes that arose in the interviews. I chose to examine the archival data last to fill in any

gaps in information I had regarding the infant case study, and the philosophy and structure of the childcare center's infant classroom.

Upon reflection on the four processes of data collection, I found conducting the focus group an enjoyable experience for everyone and it provided further clarity to the information obtained from individual interviews. Considering the answers of the focus group to the research questions, I learned that it might be more beneficial to focus on several infants, and to interview their parents and teachers. Parent diaries, follow-up interviews, and having an extended analysis period would complement and strengthen the focus-group process even more. A review of documentation would serve to cross-check data.

A few areas of this pilot study need to be considered in order to ensure the greater usefulness of the results. Careful questioning during interviews was one aspect to tend to, especially in avoiding leading questions towards what I, as the researcher, hoped to hear. It was not necessarily the questions that were in need of adjustment, but more the delivery of the questions; as the interviewer, I need to keep a neutral yet interested tone of voice throughout, so as to not lead the participant with my tonal inflections.

During observations, there were moments when events did not go according to plan. Taking into consideration that infants might not have the same sleep and wake patterns each day, especially as they develop, necessitates a flexible approach with scheduling. Keeping in mind that data collection tends to occur under certain time constraints, having more than one case study will prove useful in conducting observations.

Archival data taken from the center's literature provided the necessary information on the background and philosophy of the center. Memos from *LifeCubby* provided brief descriptions of the infant's daily life. I would continue to refer to any articles or literature that provide insight, and I welcomed daily memos that teachers or parents wished to share with me. While *LifeCubby* submissions provided insight into how the infants were developing, field observations and interviews would likely retrieve the relevant information as well.

It appeared that teachers in the classroom used music instinctually, even if they were simply speaking the name of the infant in a sing-song-like fashion. At one point during the observation, two teachers were singing fragments of the same children's song at different times for diaper changing and engagement, which later turned into partner songs as they sang simultaneously but at different starting points. One challenging question, to which the focus group gave serious consideration, was about differentiating between singing and speech in infants. The final question asked their thoughts on music being *embedded* in infants; it was very interesting how they then tied in their own reasons for using music and singing (traditions, routine, self-soothing mechanism, and transitions). The idea that music is embedded in infants refers back to the biological basis of music in that it is inherent in human beings.

The primary functions of music that arose in this study were comfort, communication, and exploration. Ideas that emerged from this pilot study were that music is inherent in infants and that music was used for routines/rituals, transitions, and as a way to pass down traditions. Preliminary findings from this pilot study showcases three themes that emerged from the data. While weekly music classes offered the infants and

myself an opportunity to engage in musical activities on a routine basis, the findings presented exclude music time. These themes center around the following ideas: (a) Care teachers and parents as partners in facilitating music, (b) music as motivation for motor activity, (c) music as a catalyst for relationship building, and (d) the childcare center as musical models for healthy social development.

Participants and Setting

Since I have been observing the infants and working in the infant room, I have had the opportunity to center my attention on their musical behaviors both during and outside of music time. A child-led approach is an integral element of the childcare center's emergent curriculum, as the infants, toddlers, and preschoolers learn through play and discovery. I find this setting to be beneficial for this study, as activities are designed with the child in mind (Recchia & Shin, 2012). During my interactions and observations, I became interested in the varied forms of musicality exhibited by these infants. During the course of the study, I became interested in the many forms of musicality enacted by these infants. They imitated sounds, matched their movements to music, and explored parameters such as dynamics and rhythm. Therefore, the study focused on the seven infants enrolled in this class, all under 2 years old (See Table 1). Since the childcare center is a university research facility, I did not anticipate any issues going into the study with gaining permission from both the parents and the center to proceed.

In selecting the candidates for this study, purposeful sampling was considered an important strategy, as all teacher participants should have experience with the phenomena

being studied (Creswell, 2013) whether directly, or indirectly. In this study, teacher participants had substantial time in the infant classroom and knowledge of the infants so that they could share substantial insights and observations about musical behaviors.

Using the staff contact list, I contacted the two head teachers (HT1 and HT2) and two graduate assistants (GA1 and GA2) of the infant room, as they had been working closely with these infants from the beginning of the school year. Head teachers shared the infant workload between them, and graduate assistants worked 20 hours weekly and supervise the practicum student teachers working in the infant room. Interview candidates were contacted by email providing information regarding the background and purpose of the study, how I learned of them and received their contact information, and the time required for face-to-face interviews. Head teachers were interviewed twice, once at the beginning and once at the end of the study; graduate assistants were interviewed once at the beginning of the study. Alternatively, using communication technologies such as *Skype* or *FaceTime* was also an option if in-person interviews were not possible. In this case, however, all of my interviews were face-to-face.

The parents of each infant were interviewed once, during the first month of the study. I emailed the parents, providing information regarding the background and purpose of the study, and the time required for the home visit interview, generally 45-60 minutes. Both parents of an infant were invited to interview.

Field observations were conducted on site at the childcare center beginning the first month of the study, either in the classroom or from the observation booth. The number of infants at the start of data collection included seven babies, comprising three

boys and four girls, all under the age of two. By the conclusion of the study, one female infant had already left for the summer.

Table 1

Ages and Genders of Infants

Infant	Age	Gender
Cyndi	20 months	Female
Frederic	19* months	Male
Lily	18 months	Female
Benny	15 months	Male
Max	11* months	Male
Ashlee	11 months	Female
Devynn	6* months	Female

Note. * denotes infants on the cusp of a birthday

Instrumentation and Data Collection

Interviews

Interviews were conducted using a semi-structured approach in order to allow for the subjects' stories to unfold. The interview protocols are organized by the following themes:

- A. Background information and musical experience
- B. General questions about infants and music in the classroom, and general questions about music at home
- C. General infant information
- D. Musical behaviors
- E. Questions that emerged from video clips or other data

Protocol A provided the musical history of the interviewee, which leads to the teachers' current involvement with infants; for the parents, Protocol A provided background information on traditions, culture, and customs. Protocol B sought to compare current research with the interviewee's experience of how music serves the classroom according to research and their personal and professional experiences. For the parent interviewee, protocol B examined how music was used in everyday life. Protocol C allowed the interviewees to describe the development of the infants and how teachers and parents interacted with them in their respective environments. Protocol D identified the musical behaviors of the infants by discussing musical preferences, and responses to their peers and to musical stimuli, and how they might be related to everyday functions. Protocol E covered any emerging questions that arose from other data sources. For parents I also showed music time video clips of their child. Using video recordings from the infant music classes, excerpts were played to the interviewee as a stimulus to recall what they observed. For teachers, I did not show these video clips; instead I used this time for any other emerging questions. The intent of these questions was to uncover the musical behaviors of infants and how the participants interpreted the function of these behaviors. I conducted a second interview with head teachers. Questions focused on changes in musical behaviors that evolved during the study and any questions for clarification purposes (Appendices A and B).

Field and Video Observations

I used observation protocols to note the sequence of events, identify musical behaviors, and include a space for comments (Appendix C). In-person weekly observations and observations of videos taken during weekly music time provided

opportunities to examine and identify musical behaviors in the classroom both those of the infants and the teachers. The protocol potentially allowed for descriptive and reflective notes as well as emerging themes that might later arise (Creswell, 2013).

In helping adults identify musical behaviors in their children's early years, the Eastman School of Music's early childhood program presented a program to include 10 weekly sessions for babies from age four to 24 months and their parents, as well as method classes for pre-service teachers (Fox, 1989). These community courses called MusicTIME (Toddlers Infant Musical Experience) provided parents with activities to engage their children musically. Parents in this program used the MusicTIME Behavior Profile to identify and describe behaviors in four categories: (a) vocal development, (b) movement response, (c) exploring sounds, and (d) participation. Profiles were used to record growth in children who continue the music program as well as to compare data across age levels.

In this study, I created a music behaviors checklist (Appendix D) in order to identify musical behaviors in the classroom by adapting and modifying some of the behaviors listed in Fox's MusicTIME Behavior Profile (1989). Combined with my own video observations of infants and selected vocalizations (Tafari & Villa, 2002; Tafari et al., 2008) on infant musicality, including glissandi, intervals, sung syllables and words, this chart was used by me immediately post-observation in order to further specify behaviors seen and heard. I also used it for all other data sources where text from transcripts and diary entries described behaviors. I used three random video recordings of infant music lessons taken between October and November of 2016 in order to pilot the behavior checklist. Selected musical behaviors were chosen from previous studies (Fox,

1989; Tafuri & Villa, 2002; Tafuri et al., 2008) based on my own infant room weekly observations during the spring of 2016. The list of behaviors was piloted and narrowed down by identifying them in the three infant music time videos. Additional behaviors noticed during the videos were added to the chart, as it was finalized. This checklist allows space to describe musical behaviors that are not listed. The musical behavior checklist would later be applied to the collected parent and teacher diary entries as a possible coding tool.

Document Review

Document review provided relevant background information of how classrooms support learning for infants. These data indicate whether musical behaviors were being seen and heard, and how teachers respond to various musical behaviors. Data includes parent and teacher memos, photos, videos, and any other relevant artifacts sent to me.

Parent and Teacher Diaries

Parent and teacher diaries (Appendices E and F) were used to record the behaviors parents and teachers consider musical and provide an outlook on how musical behaviors arose within a given context, whether they were infant-initiated, adult-initiated, or shared experiences. Diaries aimed to explore how music might be cultivated at home and in the classroom depending on the traditions and cultural practices of the household. These entries were informative in generating interview questions. Based on Custodero and Johnson-Greene's (2008) study on reciprocal influences in musical parenting, the diary template was utilized by parents and care teachers as observers in recording infant

musical behaviors. Entries included information on the time, location, people involved during the event, and a description of what happened, followed by a reflection.

Data Collection and Procedures

Data collection took place over five months beginning in early February 2017. Invitation letters emailed to teachers and parents (Appendices G and H), as well as consent forms (Appendices I and J), were explained in detail, signed, and dated prior to the commencement of the first interview. Interviews with teachers took place at a location of their choice, in this case at the early childcare center or in the university's library, lasting either 30 or 60 minutes. Parent interviews took place in their homes, which provided further insight into an infant's home environment. During the home visits, I positioned myself on the floor or carpet of the interview space in order to maintain eye level contact with infants (as I do in music class), as well as to gain a perspective of the home environment from the infant's view. At the end of the visit, I immediately wrote reflective notes and drew a map of the interview space and general floorplan of the home. Interviews were audio recorded with the permission of the participants and transcribed verbatim. All interviews followed the protocol sequentially to maintain consistency for comparison. Transcripts and signed consent forms were emailed to the participants for their records and for any corrections they felt necessary. Outside of the transcript, pseudonyms for infants were applied, and adults were identified by their title (head teacher, graduate assistant, Mom, Dad).

Table 2

Data Collection for Field Observations (FO)

Field Obs. #	Date	Duration (minutes)	Observation Location
FO-1	Feb 7, 2017	30	Infant room
FO-2	Feb 7, 2017	45	Infant room
FO-3	Feb 8, 2017	40	Observation booth/entranceway
FO-4	Feb 13, 2017	57	Infant room
FO-5	Feb 14, 2017	50	Infant room
FO-6	Feb 15, 2017	68	Infant room
FO-7	Feb 16, 2017	90	Infant room
FO-8	Feb 21, 2017	63	Infant room
FO-9	Feb 24, 2017	60	Observation booth
FO-10	Feb 28, 2017	30	Observation booth
FO-11	Feb 28, 2017	25	Infant room
FO-12	March 1, 2017	35	Infant room
FO-13	March 2, 2017	35	Dance space
FO-14	March 2, 2017	47	Infant room
FO-15	March 9, 2017	50	Infant room/observation booth
FO-16	March 9, 2017	61	Infant room
FO-17	March 22, 2017	30	Infant room
FO-18	March 22, 2017	64	Infant room/toddler room
FO-19	March 23, 2017	90	Infant room
FO-20	March 28, 2017	30	Toddler Room
FO-21	March 29, 2017	65	Infant room
FO-22	March 30, 2017	40	Infant room
FO-23	April 17, 2017	50	Observation booth
FO-24	April 19, 2017	40	Observation booth
FO-25	April 20, 2017	84	Dance space/observation booth/hallway
FO-26	April 24, 2017	45	Observation booth
FO-27	April 27, 2017	30	Observation booth
FO-28	May 1, 2017	35	Observation booth
FO-29	May 4, 2017	35	Observation booth
FO-30	May 8, 2017	35	Observation booth
FO-31	May 16, 2017	35	Observation booth
FO-32	May 17, 2017	65	Observation booth
FO-33	May 25, 2017	81	Observation booth/toddler room

Upon approval from the faculty and onsite directors of the center, I began field observations at the early childhood center, and data was collected by me alone. Since the center is a university research facility, and I am the instructor for their weekly music time, I did not anticipate any issues with access. Observations took place weekly either in the classroom or from the observation booth, totaling two to four hours per week (see Table 2); the collected videos of recorded music classes took place weekly during the spring term of 2017, from February through May. There was a total of 10 video sessions. In transcribing the videos, I used the field observation template and the adapted music behaviors checklist (Appendix C & D) to identify and record behaviors post observation.

Document review was ongoing throughout the study. It consisted of past and current literature provided for parents who enrolled their children, any memos from teachers to parents through *LifeCubby* (when shared), and any videos and photos that are taken in the infant room, or at home, that parents and teachers wished to share.

Diary templates were given to parents and teachers during the first interview. We discussed the template, and they were asked to record at three different points during the study. They could share their responses by email or text message as an audio file or as a written commentary. Participating teachers in the infant room were encouraged to provide entries that included musical behaviors they noticed in the infants. Since infant and teacher schedules could be unpredictable, it was important to allow enough time for rich data collection, while at the same time allowing space and time for any issues to be resolved. As a field researcher focusing on infants, I realized that one cannot control the circumstances that may arise. By remaining flexible and accounting for changes in the

situation, the study was designed to reflect the complexity of real-world musical experiences. Table 3 delineates the timeline of data collection.

Table 3

Timeline of Data Collection

Time Frame	Data Collection/Procedure
November 2016	Pilot of the Researcher Musical Behaviors Protocol: Using videos recorded during infant music time, the musical behaviors checklist was piloted to choose and narrow down a set of behaviors evident in the videos. This list of behaviors supplemented the observation protocol.
January (early) 2017	IRB Approval: An application of this study's proposal was submitted to the Institutional Review Board and approved with suggested revisions.
January (mid) 2017	Data Collection Preparation: Parents and teachers were contacted with a letter of introduction and consent forms. Consent forms were signed and returned to me.
January (late) - May 2017 January (late) - February 2017	Weekly Observations: <ol style="list-style-type: none"> 1) Weekly systematic observations of the infants took place in the infant room or from the booth. 2) Each music time session (30 minutes) with the infants were video recorded weekly for observation. Interview #1: The first round of interviews began for parents and teachers. Parents were interviewed in their home. During this visit, I viewed the interactions between the parent(s) and the child in the home environment. One visit lasted approximately 45-120 minutes. At this time, I answered parent inquiries.
March/April 2017	Diary Study 1 March 3-March 9: First set of entries began for parents and teachers. Diary procedures were discussed during the interview. Preparation of Interview #2: Head teachers were contacted to set up for the second round of interviews. Diary Study 2 March 31-April 6: Second set of entries began for parents and teachers.
April-June 2017	Interview #2: The second round of teacher interviews took place. Diary Study 3 April 28-May 4: Final set of entries began for parents and teachers.

Data Analysis

To answer the research questions, I examined interview transcripts, diary entries, and observational notes for themes and patterns; documentation served as supplemental data. For a matrix of this plan, refer to Table 4.

RQ 1. What are the ways in which infants are musical?

By examining interview transcript data, I identified the musical behaviors that occurred at home and in the classroom. By analyzing observational data from the field and videos, I was able to verify similarities or differences in the descriptions of musical behaviors related to vocalizations and movement given by teachers and parents. Document review data in the forms of teacher memos, teacher diaries, and parent diaries helped to identify infant musical behaviors from the teachers' and parents' perspectives.

RQ 2a. What do parents report regarding musical behaviors in the home?

Interview data focusing on the family's cultural background and any musical traditions at home identified musical behaviors that occurred with their infant child, and how parents might have cultivated these musical experiences for their child. Parent diaries captured musical behaviors when parents were with their infants. The home visits provided environmental information that gave me insight into the family's culture, musical resources, and musical behaviors and interactions that took place at home. Any further documentation or artifacts that parents shared with me helped to capture musical behaviors and inform me of their perspectives on musical behavior.

RQ 2b. What do teachers report regarding musical behaviors during music time and outside of music time?

Interview data provided information on how infants use music in the classroom and how it was encouraged and cultivated by the teachers. Documentation served to justify the actions of the teachers in how they use music making in their classroom, as they were reported to me as email memos, or video artifacts. Additionally, this data gave me an insight as to whether music was child-initiated, teacher-initiated, peer initiated, or a combination of these. Teacher diaries afforded a perspective on behaviors they considered musical, and through the descriptive context, provide their probable function.

RQ 2c. How do musical behaviors of infants vary depending on whom they are with?

By examining all the data collected throughout this study, I gained insight into how the relationships of infants might vary through time and space. Data served to inform me of the location and any relationships that formed within these different contexts. Relationships include those with adults or with their peers and take into account the “musical” objects that infants seem to favor.

RQ 3. What function(s) do the musical behaviors serve?

Interpretations of musical behaviors described by teachers and parents during the interviews and from the diaries were used to match the functional purpose of musical behaviors. Data from the interviews were analyzed, compared, and contrasted in order to identify recurring themes or patterns. Once the categorization of data was complete, connections between key words were illustrated visually for each section of the protocol,

which includes the themes, research questions, and answers to interview questions. Field and video observations were analyzed using the musical behaviors protocol along with any relevant notes taken.

Table 4

Plan of Analysis Matrix

Data Source	RQ 1	RQ2a	RQ2b	RQ2c	RQ3
Parent Interviews	X	X		X	X
Teacher Interviews	X		X	X	X
Field Observation	X			X	X
Video Observation	X			X	X
Parent Diary	X	X		X	X
Teacher Diary	X		X	X	X
Document Review	X	X	X	X	X

Note. The research questions identified as RQ1, RQ2a, and so on, are identified in the section, “Data Analysis.”

For each child’s data set, I identified musical behaviors from each data source and created episodes for each infant (see Table 5). The child’s musical experience in each episode became the unit of analysis. Episodes start and end at a place in the data source where I could get the most contextual information. I analyzed each episode for musical behaviors, functions, and any other information I felt was significant or relevant in answering the research questions.

I titled episodes as a way to summarize them and ordered them according to setting: (a) data from home (parent interviews, diaries, artifacts); (b) data from school (teacher interviews, diaries, artifacts); and (c) researcher’s data (field observation notes and music time video transcripts). Musical behaviors were identified as vocal, movement, instrument play, or listening.

Table 5

Number of Episodes Extracted from Data Sources

Infant	PI	PD	GA1	GA2	HT1	HT2	FO	VO	Total Episodes
Cyndi	15	41	3	3	1	5	13	17	98
Frederic	15	0	6	4	7	11	20	17	80
Lily	14	16	6	7	5	7	18	17	90
Benny	13	0	1	5	6	7	26	14	72
Max	11	20	2	2	2	7	23	19	86
Ashlee	16	15	3	2	5	6	24	11	82
Devynn	12	16	4	3	2	5	18	19	79

Note. PI = Parent Interview; PD = Parent Diary; GA1 = Graduate Assistant #1; GA2 = Graduate Assistant #2; HT1= Head Teacher #1; HT2 = Head Teacher #2; FO = Researcher's Field Observations; VO = Video Observations

I analyzed each episode to consider the possible function that each musical behavior served. I delved further into literature (Custodero et al., 2016) to identify functions for each behavior as the following: to comfort, to communicate with others, to explore, to accompany imaginative play, and to accompany motor activity (Appendix K). It was difficult at times to determine function since I was relying mostly on written data. During my own field observations, multiple interactions were usually happening simultaneously in the infant room, and I focused on all infants present and the dynamics between them and their caregiver. Therefore, it would have been easy to exclude details inadvertently. Analyzing behaviors that did not provide enough contextual information to identify function were listed as undetermined. Behaviors that exhibited two or more simultaneous functions were added to the coding scheme as combination functions.

For each infant's data set, I analyzed episodes in the following sequence:

1. I identified behaviors and functions, took note of any relevant pieces of information or connections to other pieces of data, and created a title for each episode.
2. I reduced data further by narrowing down episodes, removing any that were not specifically related to the child's music behaviors, but might provide supporting information.
3. Then, I analyzed each episode several times to recheck my initial analysis and to better identify function after searching the literature for clearer descriptions. I input letter and number codes in a spreadsheet for each episode by child under the following headings: behaviors, functions, initiation of behavior, and setting (data from home, school, field observations, music class).
4. Using SPSS Statistics, I input and defined variables (numeric) into SPSS. I checked episodes once again before running the number codes to obtain frequency for behaviors and functions as determined by setting (Appendix L).

In order to check that my interpretation of behaviors and functions was credible, I formed a consensus team in order to ultimately engage in discussion in how we perceived the data. I trained two fieldwork music students who worked with me in the infant room to examine approximately 20% of episodes and to identify behaviors and functions. These students were not present during data collection, but they worked with me during infant room music. Using an online random number generator, I randomly selected a proportion of episodes from each setting for each child to determine if there was a consensus in

coding the infant musical behaviors, which constituted approximately 20% of total episodes per child (Love et al., 2002).

In setting up the reliability check, descriptions for identifying behaviors and functions were distributed to the team in order to check that the behaviors and functions I observed in each episode were consistent with their findings. After considerable deliberation, the following consensus was reached during debriefing: (1) behaviors identified were consistent with my findings, (2) each reviewer including myself seemed to lean a certain way when identifying function, (3) in general there was difficulty in identifying function, (4) listening was the function that was most likely listed as undetermined. The review team felt that due to the nature of simultaneous events happening in the infant room, it was difficult for them to keep track of each infant and what their possible functions would be. They also felt that I, as the researcher, was a more reliable source in determining function since I knew the infants and have worked with them personally in the music classroom. I actually felt that a fresh perspective would possibly benefit this study in determining reliability. This appeared to be the case in identifying musical behaviors, as we seemed to agree on the behaviors we identified. In identifying function, there were consistencies, however there were episodes where function could be interpreted as more than one function, not necessarily as a simultaneous event.

Ethical Considerations

By conforming to the standards of the Institutional Review Board (IRB), ethical considerations towards all participants were regarded as high priority. Since I was the

music instructor for the infant room, my presence there was a natural one, as it was part of a routine in the infant room. As the early childhood facility centers its philosophy on child-centeredness, no child is forced to participate in any given activity at any time. I respected and was conscious of any emotional responses that came from the infants if any signs of discomfort arose, and caregivers were present at all times to attend to the infants. My weekly presence outside of music time was purely in the role of observer and researcher.

The research proposal was submitted and reviewed by the IRB. Upon approval, I sought consent from all adult participants before data collection began. As both a researcher and professional teacher, I ensured that all infants present, whether they were participants in the study or not, were treated with respect and care, to the best of my intentions, effort, and knowledge. I worked with these infants within a play-based and child-centered curriculum. Therefore, no infants were evaluated or graded in any way. While the childcare center is a research facility dedicated to children's development and learning, I have maintained the privacy of all participants through the use of pseudonyms and generic titles.

Issues of Trustworthiness

Data collection for this study included archival documentation, field notes, interviews, and diary entries. Some validity issues and possible strategies for dealing with these issues have been considered. During interviews, my presence might have led the participants to answer questions with what they believed to be socially desirable responses. Since this study included follow-up interviews with head teachers, specific

questions from the protocol were administered in further interviews in order to measure consistency and to cross-check previous responses. It is important to note that as I was both the researcher and the musical instructor, there was the possibility that my presence in the setting might have had undue influence upon study participants (Maxwell, 2013). As the researcher, I was mindful that the protocol questions were not leading in nature. By providing enough open-ended questions and being aware of the wording of certain questions, I strove to ensure that responses would be free from undue influence. It was also of concern that during interviews parents would search for musical cues that do not truly exist in order to provide a satisfying response to the protocol questions. Again, by being mindful of providing enough open-ended questions and allowing the participant to speak and form their own opinions, I attempted to ensure that participants were not misled into providing information that they imagined the researcher preferred to hear.

For parent and teacher interviews, I was concerned that some individuals might have been less likely to voice their opinions due to either the reserved nature of the individual or not being able to recall details in the moment. The diaries provided another source for them to record their insights in the moment without the disturbance or pressure of a live interview.

In case field notes from observations did not provide enough detail due to memory recall or distractions in the classroom, I wrote brief reflections and comments during or immediately after each observation. Photos taken during observations as well as by caregivers outside of them served as cultural artifacts providing insight into the musical behavior. Additionally, music lessons as observation were video-recorded during this study, and any memos the teachers recorded and shared with me during music time

provided a cross-check to my own reflective observation. Since observations were in the infant room, it was likely that the infants and teachers would subconsciously respond to my presence. During data collection, observations were also conducted from the observation booth to address this issue.

In identifying the functions of infant musical behaviors, interpretative behaviors considered as musical would be subjective to each individual, in this case the parents, teachers, and myself. Having enough data to revisit, check, and clarify further any insufficiencies helped identify the necessary connections in order to define function for specific musical behaviors.

Chapter Summary

In order to explore the musical behaviors of infants and their possible functions, a qualitative case study design incorporating a case study of an infant room as a community was employed. Through a series of carefully selected research questions, data collection included interviews with parents and teachers of the infants, in-class field observations and observations from the booth, video observations, document review containing teacher memos, photos, videos, and any other relevant artifacts, and parent and teacher diary entries. Upon approval from the Institutional Review Board, informed consent was obtained from participants before data collection began, and ethical standards of confidentiality were maintained. A pilot study, conducted in the spring of 2016, provided a framework for the methodological design of this proposal. This chapter concluded with strategies of maintaining the reliability and integrity of the data gained in the study.

IV – PORTRAITS OF FOUR INFANTS AGES 15 TO 23 MONTHS OLD

Introduction

The purpose of this study was to explore and understand the function of music in a community of infants. Chapters IV and V address the research questions pertaining to the musical behaviors of infants, information reported from parents and teachers providing insight into how infants are musical at home and in the school environment, the social interactions that were influenced by music, and the functions of infant behaviors that might serve infants. Data included interviews and diary entries from parents and teachers, artifacts sent from teachers, weekly field observations, and 10 video recorded music time sessions.

Data were organized by parent data, teacher data, field observations, and video observations. Musical episodes were extracted from each data source for each child so that the unit of analysis was the child's musical experience in each episode. Episodes were framed with a starting and ending point outlining a complete musical sequence that was enacted or relayed. For each episode, I identified the following: (a) a brief description of the episode, in the form of a phrase or sentence that summarized each episode; (b) a list of the musical behaviors that took place; (c) any significant information that I noticed, for example, whether the child or music was in control during the episode or environmental factors that might be of influence; (d) possible definitions that emerged, for example what adults might consider singing or musical in infants along with any links to other pieces of relevant data I might have noticed; (e) adult's intent in

engaging with music and/or infant's intent, which is related to the function of musical behaviors. The total number of episodes from each child varies culminating in a total of 587 episodes for seven infants, identifying 934 music behaviors. Musical behaviors were categorized as vocal (V), movement (M), instrumental play (IP), and listening (L).

Table 6

Infant Age and Episode/Behavior Count

Infant	Age (start)	Age (end)	Gender	Episodes	Behaviors
Cyndi	20	23	F	98	123
Frederic	19*	23	M	80	117
Lily	18	21	F	90	150
Benny	15	18	M	72	119
Max	11*	15	M	86	147
Ashlee	11	14	F	82	143
Devynn	6*	10	F	79	135

Note: * denotes infants on the cusp of a birthday

Vocal behaviors (312) were the most prevalently identified, followed by movement (255), instrument play (213), and listening (154). The most frequently identified perceived functions were (a) to communicate with others, and (b) to explore. Musical episodes were also categorized by their setting whether they took place at home, school, or during infant music time at school. Data from home and school included interviews with parents and teachers and any collected diary entries and artifacts. Researcher episodes that include field observations and group music situate within the school setting, viewed from the researcher's perspective.

From the viewpoint of setting, the most prominent behaviors at home for all infants were listening and movement; at school, both teacher interviews and my field observations resulted in more vocal behaviors. Movement was the most documented behavior from my video observations of music time. As music class is a time and place where infants come together as a group to specifically engage in music, it is important to note that it would be natural to gather musical behaviors from this time which specifically stem from my presence in order to facilitate musical activities. While I might initiate musical behaviors, the emergent curriculum and child centered setting allowed me to step back and offer children a space for their preference and desires during our music making. I created musical episodes in this setting in hopes of highlighting musical behaviors that might connect with the children's identity in the music time setting, as well as what I might notice in other settings; I also looked for behaviors that arose during group music that might not happen in other settings. This allowed the various facets of a child's individual musical personality to emerge, as well as to showcase how peer relationships might become apparent or differ during music time.

During group music, infants were free to participate or not participate in the activities, as it would be my job to seek out their interests to draw them in to the music community of infants. Additionally, determining the behaviors and function of their behaviors provided a different perspective of how these infants use music. While the concentration is on the group dynamic and the musical activities, it was interesting to see how they compared across settings by child. Ten codes were created to describe functions, two or three codes together indicate that a musical behavior exhibited more than one function simultaneously in an episode.

Table 7

Coding for Functions

Function/Combination Functions	Letter Code	# Code
Comfort	COMF	1
Communicate	COMM	2
Explore	EXPL	3
Accompanying imaginative play	IMAG PLAY	4
Accompanying motor activity	MOTOR	5
Undetermined	UNDET	6
Comfort & Explore	CFE	7
Communicate & Explore	CME	8
Communicate, Explore, and Imaginative Play	CEP	9
Comfort and communicate	CFCM	10

The findings of this study are divided into two chapters. Chapter IV presents portraits of four of the older infants, Cyndi, Frederic, Lily, and Benny. While Benny's age seems to fall between the older and the younger group of infants, he seemed to engage in shared activities more frequently with the older infant group. Therefore, his portrait is presented in Chapter IV. Chapter V presents portraits of the younger infants, Max, Ashlee, and Devynn. I present both groups, starting from oldest to youngest. I present portraits of each child, portraying their individual musicality, across all settings: home (parents' lens) and school (teachers' lens, researcher's lens, and music teacher's lens). Analysis will address the musical behaviors typical of a particular child, as reported by parents and teachers, as well as from my perspective, and the most prevalent functions

that emerged from data analysis. I will highlight any references to relationships in the classroom that music helped to cultivate.

Cyndi: The Supersonic Listener

Parents' Lens: Musical Cyndi at Home

Cyndi was a 20-month-old bilingual infant at the beginning of the study. Her father spoke English and her mother spoke Mandarin, creating an environment which included music from both western and Chinese cultures; her parents sang to her in both languages. An amateur flutist, her mother on occasion would bring out the flute to play. Cyndi's paternal great grandfather was a professor of voice and sang professionally, and Cyndi has listened to his recordings. In the home environment, Cyndi exhibited all musical behaviors with listening as the most frequent behavior. While many of her episodes were coded as undetermined functions, exploration, communication, and comfort were other prominent functions perceived.

During the interview, I sat on the carpet in front of a bookcase of children's books. Next to that is a cabinet that houses the stereo, and a tiger piano, identical to the one in the infant room, sits there as well. During the interview, Cyndi's mother described how the family had just listened to Beethoven's 6th symphony before my arrival. Cyndi was swaying her body while laughing, and her mother held her hand while they swayed around the room.

Listening and agency. Cyndi listens to music a lot, and there are several sources to which she responds. At bedtime, both parents sing to Cyndi, and her mother sings to Cyndi in Mandarin. While Cyndi has joined in on the singing, most of the recorded

episodes indicate that she enjoyed listening to various songs by requesting, “more” from both her parents. In some cases, she became upset when a parent finished singing and started to leave the room, as if Cyndi was not completely finished with bedtime songs. During one particular episode when Cyndi’s mother was singing to her at bedtime, Cyndi kissed her mother’s hands and called out, “mama” and, “dada” softly. As time passed during the study, her listening repertoire expanded, as she requested for more songs. The following episode is a diary entry describing Cyndi becoming upset as a way to let her mother know she wants to hear a different song.

Episode 53, Parent Diary, 8:30 a.m: [Mom] sang to Cyndi in Chinese to calm her down for bed. Cyndi likes this very much. Sometimes if [Cyndi’s mom] sings a song Cyndi has heard before, Cyndi gets upset because she wants to hear new songs.

The “Firebunny,” a device that resembles a bunny and plays both Western and Chinese classical music, as well as Chinese children’s songs, has become a common source of music for Cyndi. She requests this device by pointing to it and listens to the song output while her parents are getting ready in the mornings. The evenings are also times she plays with the Firebunny. She is able to adjust the volume herself and at times, she has it turned on in the background during her play. The following diary entry describes Cyndi listening to the Firebunny one morning.

Episode 30, Parent Diary, 7:30 a.m: Cyndi listened to classical music on her Fire Bunny. Towards the end she was in her pack and play while [Cyndi’s Dad] got ready for the day. She played with the volume and made it very loud. She has adjusted the volume on the fire bunny for many months.

There is a stereo system in their living room where music is played and heard, and at times, Cyndi has also looked and listened to *YouTube* videos of concerts with her parents. Very often, Cyndi would request music on the stereo system, which she is able to turn on

herself. One of the most requested pieces of music Cyndi requests is Beethoven's *Pastoral Symphony*. While she has been listening and swaying to this piece since she was a younger infant, she laughs and enjoys dancing as her mother holds her to dance or as they stand facing each other swaying to the music. Cyndi will often request this piece to be played in the background and will continue her own play. While it may not be obvious that she is listening to the background music, when the piece stops, she is the first to notice and to ask for more. During the time of this study, Cyndi learned how to turn on the music herself. The following diary entry describes Cyndi requesting for Beethoven's *Pastoral Symphony*.

Episode 28, Parent Diary, 6:30 p.m: Cyndi pointed at the TV while we were sitting on the couch. [Cyndi's Dad] asked Cyndi if she wanted to listen to music. Cyndi made an affirmative noise. [Cyndi's Dad] said, "why don't you go turn on the music?" and Cyndi turned on the CD player and pressed play. We listened to Beethoven's 6th Symphony as we went about our evening. Cyndi has known how to turn on the CD player and hit play for at least a month.

Cyndi has a bookcase in the living room with several books that invite musical behaviors such as Dr. Seuss' *ABC* book and a musical interactive book with 10 buttons that play different songs. During the study, Cyndi received this interactive musical book as a gift. For the remainder of data collection, it became one of her most frequent activities. The pages of the book contain lyrics to songs, and by pushing a button, Cyndi can hear the music for the particular song (without lyrics) as a musical accompaniment. She listens to it many times at home throughout the day and will dance along to it alone and with her parents. A diary entry reported how she involved her father one evening in her parents' bedroom.

Episode 46, Parent Diary, 7:40 p.m: Cyndi and [Cyndi's Dad] stood where they could see each other in the closet mirror. Cyndi played music on her music book, and danced, and [Cyndi's Dad] tried to copy how Cyndi was dancing.

Cyndi had a lot of fun. Cyndi and [Cyndi's Dad] stood where they could see each other in the closet mirror. Cyndi played music on her music book, and danced, and [Cyndi's Dad] tried to copy how Cyndi was dancing. Cyndi had a lot of fun.

Cyndi's responses to musical sources seem to revolve around choice and agency.

At bedtime, Cyndi indicates to her parents verbally (by saying, "more") and emotionally when she is not finished with listening to songs. To keep her from becoming upset, her parents accommodated her by singing different songs, providing more options for Cyndi's listening. By adjusting the volume of the Firebunny and turning on the stereo on her own, she is choosing her musical preferences and initiating the activities independently. Being able to press buttons and choose a particular song from the interactive book also provides choice of music for her and others to respond by dancing.

Moving to music alone and with others. Along with dancing alone, she also enjoys dancing with others. Cyndi enjoys listening to Beethoven's symphony and swaying to the music. Cyndi operates the musical interactive book so that she can dance to it. From solitary dancing, she dances with her mother to Beethoven, and with her father, she selects the song from the musical book for dancing. Her parents reported that she also enjoys action songs like "If You're Happy and You Know It." She interacts and claps while her parents sing the song. During the interview, her parents recalled the first time she heard/saw a Chinese opera demonstration in China, and how she was mesmerized with that experience. Her father described her reaction as flipping out during the opera demonstration, and they mentioned a certain facial expression she had during the demonstration. In the particular video clip that her parents shared with me during the interview, her response was a particular smile while her hands and legs moved to the sounds she heard.

Cyndi moves to music alone with some of her preferred listening objects and repertoire. She is moving to the songs she chooses from the interactive book. She invites her parents to join her in the music making process, from moving and listening alone to engaging with her parents. By selecting her songs and inviting her parents to participate in her music making, she is displaying ownership of her music making. She also responds to musical experiences outside of home with her parents, exhibiting movement responses and a sense of being captivated by what she is experiencing.

Playing piano in community. The 10th floor of Cyndi's building is where residents can lounge and where a community piano is located. Cyndi and her parents frequent this place quite often and it seems that many visits include Cyndi hitting keys on the piano. She will routinely visit the piano for a period of time, bang on it, and then move on to other activities before revisiting it again. Her father initially introduced her to this piano at a very young age by placing her hands on the keys and pushing them so that she could experience what it would do. The pitch range of the keys she plays on her own depends on her physical orientation to the instrument. One diary entry painted a picture of Cyndi revisiting the community piano when her mother started playing on it. During this musical interaction, Cyndi found it amusing and delightful, as she experienced a way of playing the keys with her mother.

Episode 19, Parent Diary, March 5, 6 p.m: 10th floor of our building: Cyndi stood on a chair and played the piano for a little while by herself. Then she moved onto other things. Later when [Cyndi's Mom] played the piano, Cyndi climbed up to her lap and joined her. [Cyndi's Mom] [slid] her fingers across the keys to play a scale (roughly). Cyndi found it very interesting and mimic the motion when [Cyndi's Mom] asked her to give it try. [Cyndi's Mom] held Cyndi's fingers across the keys and she laughed.

Cyndi also visits and plays with Lily (classmate) and her sister, and they live in the same building. Oftentimes on weekends, Cyndi will visit Lily's home and play with her. Lily and her older sister have a red toy piano in their home. Cyndi plays it when she is visiting with them.

Singing alone and in duet. Cyndi sings "Twinkle, Twinkle Little Star" and the "ABC" song often. While she may not have been able to sing with clearly articulated words, her parents have heard her babble "Twinkle, Twinkle" alone during bedtime. Her mother describes her solitary musical sounds as babbling to different pitches, while determining whether this would be considered singing: "When she's babbling she's doing high pitches, low pitches ... My parents call it singing, she's singing to herself. I guess you can call it singing, but it's more babbling with different tones." During the interview, Cyndi spontaneously sang the melody. Her father pointed out that at this particular time, it was the ABC song, and at other times it could be combination of that and "Twinkle, Twinkle." One diary entry described Cyndi initiating singing the song as her mother joined in duet.

Episode 33, Parent Diary, 7:20 p.m: [Cyndi's Mom] sang the first part of the ABC song and then Cyndi repeated the tones. Neither of them sang the words, merely the notes. Cyndi will often sing the first verse of the ABC song (up to the letter G) but she says, "ba" or, "da" for each letter instead of the actual letter.

Cyndi sings at bedtime, both alone and with her mother. When Cyndi sings alone, she appears to be bringing in tunes to accompany her at bedtime. In practicing singing with her mother during this period, she echoes her mother, as they sing songs.

Teachers' Lens: Musical Cyndi at School

At school the most prevalent observed musical behaviors for Cyndi were listening and movement. Perceived functions were undetermined (coming from listening), communication, and exploration. At school, listening behaviors were associated with undetermined or communicative functions; moving to music was associated with exploration and communication.

Requesting from song books. As the infant room community is familiar with using, “more” as a verbal and gestural signal, Cyndi also uses it to request musical sounds. This applies to when music playing on the speakers stops; she will notice, look at the teacher and request verbally and/or gesturally for the particular song to start again, or for music to be heard if music has stopped playing. This also occurred when a teacher finished singing a song or reading/singing a musical book. Cyndi was selective in choosing songs that she preferred to listen to. She made her requests by either bringing puppets to the teachers or particular song books that she liked. GA1 and GA2 describe how Cyndi makes her song requests.

GA1: Cyndi will come to me with the puppet. Then, also they come with books as well, which I read too. Some books, you know, just the nature of the books that rhyme or they're a little bit sing songy-ish.

GA2: They will come to me and Cyndi really like[s] the book “You Are My Sunshine,” and she will look for that book and bring it to me, so I can sing it and she's really specific on which books she likes.

Responding with movement. As mentioned in regard to the home environment, music would usually be playing in the background during Cyndi's play, and there are moments when if the music stopped, Cyndi would ask her parents for, “more.” Her parents were not aware that she was listening to the background music to begin with. In

the infant room, certain songs that played in the background would catch Cyndi's attention and she would stop what she was doing in that moment in order to listen. These moments would elicit a response from Cyndi, which included moving closer to the sound source, making a particular facial expression, and/or move to the music. HT1 and HT2 describe Cyndi listening and moving to songs.

HT1: And then "If You're Happy and You Know It" came on and Cyndi was at the snack table and she was doing all the motions and really exaggerated, and she just completely lit up and she was in the middle of eating a snack. Before that I didn't even know if she was listening, and then that came on. Even up until, no as far back as a month or two ago, it was a song that we would sing in the classroom. And she would do all of the motions. So, it was interesting to see that come up again.

HT2: Cyndi seems, I haven't asked [her dad] about it, but she seems to pick up more of the songs that are being played on the iPhone. Even if she's not anywhere near and we don't have it up too loud, but she can hear it. And that's when she'd be oh that's "If You're Happy and You Know It" or "Twinkle, Twinkle," she's the one—she'll stop and listen to it and if she knows there's hand motions to it she'll do it [...] Yeah, Cyndi, Cyndi's hilarious. Again, if it's "If You're Happy and You Know It" or any song because it was the "ABC" song too, she would drop her stuff, whatever she had in her hands and kind of like—I don't know like just a screech face, I don't even know how to explain it. Eyes almost closed because she's squinting so much, and the smile is really big and she's often a little delayed especially "If You're Happy and You Know It" and so they're starting to sing again and she's clapping her hands.

Cyndi stopping to recognize and connect with song in the moment seems to put her in a place where she is receiving the music. Her unique facial expression, as described by her teacher, seems to bring up an image of her having a private intimate moment with song, perhaps conjuring any associations or memories with the particular song. The facial expression suggests she is savoring that moment, experiencing the full effect of what the music is providing for her, and feeling every nuance of it, the sensations, before applying the gestures that accompany the song.

Researcher's Lens: Peeking into the Infant Room

During field observations, I observed vocal and movement as the top two behaviors and communication and exploration as the top two functions. Vocal and movement behaviors were most often paired with communication and exploration.

Tuneful verbal cues. Whereas parents and teachers reported several instances of listening and movement behaviors, my observations in the infant room captured more of the vocal behaviors coming from Cyndi. Aside from, “more,” another verbal and gestural signal that infants use in the classroom is, “all done” in order to indicate when they are finished with something, for example, infants say or gesture “all done” when they are finished eating their snacks. This prepares the teacher to take the infants to the sink to wash their hands before going about their play.

Episode 71, Researcher Report: As I enter, the room is dark. Three teachers including HT1 are sitting at the snack table with Max, Cyndi, Benny, and Ashlee. Devynn is on the floor on her stomach. GA1 is preparing her bottle. No music is playing in the background. This morning we had our first music class. The teacher asks Cyndi if she is all done with her snack. Cyndi says/sings, “All done,” in a descending minor 3rd.

Within this same observation, Cyndi prepared for a nap afterwards. Alone in the nap room, she sang, “all done” (*sol-mi*) three times. HT1 discussed with other teachers how Cyndi had used these words in inappropriate contexts, in the dance space and in the crib room. While these might not be the right moments to use this signal, Cyndi does sing when she is alone and in her crib. She has been heard singing at home during bedtime, and it has been reported from one teacher as well. I observed Cyndi sing fragments of “Twinkle, Twinkle” before nap time, while her teacher prepared her sleep sack. During one particular observation, her sounds were loud in dynamic.

Episode 73, Researcher Report: HT1 just came out of the crib room (from putting Cyndi in the crib); HT1 just informed me that Cyndi was singing, “Twinkle Twinkle Little Star,” self-initiated in the crib. I can still hear Cyndi singing. The teachers discuss how she is not sleeping and HT1 tells GA2 that Lily is also in the crib room. As Cyndi is heard making loud “ah” sounds, Max is next to me with spoon in mouth, making “ah” sounds as he rocks while sitting on his knees.

It was difficult to determine whether Cyndi was vocalizing to Lily, or to herself. She did not seem sleepy, and the volume of her voice continued to be heard in the infant room, while Max appeared to respond to her sound. At the snack table, singing, “all done” lets the teacher know that she was ready to leave the table.

Engaging others through song. During solitary play, Cyndi engages in singing sounds, including recognizable fragments of songs. She initiates adults into singing with her, and possibly triggers other infants to engage musically.

Episode 79, Researcher Report: I hear the syllables “ro ro” sung on the same pitch. GA2, who is sitting across from Cyndi on top of the upside-down rocker says, “Are you singing Row, row, row your boat gently down the stream?” GA2 starts singing that part of the song.

Cyndi sits on the lap of GA2 and starts to rock side to side while singing “Row Row.” GA2 picks her up and says, “We can sing the song while you get changed.” She takes her to the changing station and changes her. GA2 sings the first part of the song (Lily at this point puts a doll on top of the rocker and begins singing). When Cyndi is done with her diaper changing, she starts singing, “ro ro” and GA2 sings with her.

GA2 picks up on Cyndi’s singing by acknowledging it, followed by Cyndi requesting the song through her rocking movements. This song is a favorite among the infant community, and they sing and act out the movement. GA2 takes the opportunity to change Cyndi’s diaper while bringing along this song to the changing table. This continues until the changing is done; GA2 continues to join in and encourage the trio of herself, Cyndi, and Lily (and doll).

Discovering resonance in object. There are times when teachers decide to change the classroom set up depending on the interests and developmental needs of the infants. During one period, a blue stability ball was present in the infant room. One teacher used it to bounce herself while holding infants on her lap while chanting spontaneously involving each child's name.

Episode 80, Researcher Report: GA2 says, "Now it's my turn," and she bounces and makes up a rhyme, "Bouncing, bouncing, bouncing, GA2 is bouncing." She picks up Frederic and puts him on her lap as she chants rhyme in sync with the bouncing movement. Lily wants a turn and she comes closer, and GA2 is now bouncing Lily. Cyndi comes over and holds her arms out. GA2 tells Frederic and Lily that Cyndi hasn't had a turn. She picks up Cyndi and gives her a turn. GA2 slides off the ball. Frederic and Benny are at the ball opposite each other patting it. HT2 takes Benny to get changed. Now Cyndi and Frederic are facing each other patting the ball. GA2 picks Frederic up on the ball. HT2 is changing Benny and she sings "Head Shoulders Knees and Toes" to him varying the tempo (largo to presto). The onsite director just walked in. She sits next to Lily and converses with her. Cyndi is now on the ball, she claps her hands together while saying, "more."

Not only was this ball used as a way for babies to experience movement behaviors, but from this excerpt two infants tapped on it like a musical instrument, while facing each other. In an earlier observation, Cyndi engaged in this type of musical playing with Benny.

Episode 78, Researcher Report: Cyndi and Benny are now near HT2 with the large blue stability ball. They are facing each other tapping it with their hands together. They also put their mouth on it and continue to make noise in this way.

Cyndi and Benny used the ball as a drum, as well as to experience variations of sounds when they have their mouths on the object. The stability ball invited vocalization, movement, and instrument play behaviors. All of these behaviors engaged infants with an adult, and infants with their fellow peers. Cyndi and Benny's exploratory nature of

making sounds with the ball and tapping it while face to face show that they are learning and creating new sounds together, with the ball as a sounding board.

Music Teacher's Lens: Group Music

During music time, movement and instrumental play were the prevalent behaviors that Cyndi engaged in, correlating to either communication or exploration. The one vocal behavior that stood out to me occurred after one session, as I was leaving. I returned to the classroom because I heard fragments of song, it was Cyndi. After listening for some time and examining the video closely, I realized it sounded similar to our goodbye song, "Goodbye Cyndi, we'll see you next week." While she sings during her play in the infant room and prior to naptime, she does not sing as much during music time.

Moving in response to music. During music time, Cyndi engages in movement and instrumental play. As her listening skills are quite adept, she is one who carefully observes her surroundings during music, while considering her peers. Since I knew Cyndi listened to Beethoven's Pastoral Symphony at home, I brought it a few times during the opening segment of music time. Her response to this piece was movement-based, exhibiting her excitement.

Episode 90, Researcher Report: Returning after spring break. Pastoral symphony begins. The camera is swaying; person who is behind camera must be swaying to the music. Cyndi gives a big smile and kicks her legs as if in excitement, while a teacher holds her.

Cyndi's movement responses during musical activities that do not involve musical instruments seem to be based on her use of her legs or feet. Besides showing excitement by kicking her legs, she will tap her feet or move her legs to song. During another music time observation (Episode 82), Cyndi moved only her leg during the hello song while it

was her turn; when it was Frederic's turn, she came to sit next to him on my lap; for me this was surprising, as it was the first time she voluntarily came to me. Another episode (Episode 91) shows Cyndi once again tapping her feet in response to a bouncing song. Towards the end of the study, she started responding to the bouncing songs using her full body instead of just her lower limbs.

Cyndi's immediate response upon hearing Beethoven seemed to be positive, as she responds with her leg movements while dancing with a teacher. During our group song, she continues to join the music with her subtle leg movements. Her subtle movements grew into full body engagement as the study progressed. In previous terms, Cyndi engaged with her familiar teachers (and not me) during music. As I became a familiar face over time, she allowed me to become part of her musical experience, which took time to come into fruition, similarly to how her use of movement expanded.

Taking control of musical activities and making them her own. Cyndi indicates her preferences through her movements as well. During bouncing songs, she will sit in her caregiver's lap and move towards the direction she wishes, for example, during the song "Riding on the Pony." During a bouncing chant, Cyndi led us a few times in one direction. Proceeding to the bouncing song, "This is the Way the Ladies Ride," we move from side to side. She must have enjoyed this particular direction, as I recall she was, "swinging all over the place with this bounce while the caregiver tried to hold on to her" (Episode 96). During instrument-based songs like "Shake and Stop," Cyndi was enthusiastic about trying out the shakers in various speeds and intensity. She would sometimes do this on her own or with her peers. While I was singing, Cyndi would play her shaker and rock her body at the same time. She also anticipated movement

during the, “shake up high” and, “shake down low” part of the song. Before the musical/lyrical cue, Cyndi raised her shakers high before the group. Other examples of imprinting music in her own way included bringing a doll into the group during the peek-a-boo scarf song and participating in the goodbye song by using gestures and movements differently than I have seen in the infant room or from Cyndi.

Episode 93, Researcher Report: Cyndi brings the baby doll to the group for the scarf song. We sing the scarf song and she pulls the scarf off of the baby before the musical cue.

Episode 95, Researcher Report: Goodbye song. Cyndi makes a gesture with her right hand to her hair as she slightly moves/dances her body to the music and stops after the claps.

The goodbye song usually involves singing a short phrase that includes the child’s name, with an opportunity to clap twice during the last two words of the song “Can’t Wait.”

Cyndi ends music time with her own Cyndi style.

In the episodes where Cyndi anticipates musical cues and expands upon them to make them her very own, she seems to be expressing herself in dynamic ways. In taking the behavioral pieces (movement, singing, playing) to the next level, she takes the activities further in her creative process, trying it on for size while expressing it at the same time, giving a glimpse of how musical Cyndi is.

Summary of Cyndi

At home, Cyndi listens to music frequently, most notably to Beethoven’s 6th Symphony, music from her Firebunny, and her interactive music book. This behavior seems to provide a sense of comfort for Cyndi throughout her daily activities, and she extends it by inviting her parents to join her in music making. With these musical objects, she will move to music alone but also seems to enjoy communicating through movement

with her parents. Exploring the community piano also became a familiar activity for her. While she would frequently return to the piano on her own, she was also exploring the keys with her mother, as she worked out new ways to play.

At school, Cyndi sings in the crib often, sometimes alone or with peers present. When alone or with her mother, it appears she derives a sense of comfort during bedtime singing. Due to her acute listening, a familiar song will stop her in her place, as she takes in and relishes the moment, as if entertaining herself before requesting, “more” from her teachers.

During my observations, Cyndi uses the infant community gesture for, “all done” to communicate her needs in a musical way by singing it, as well as taking the text and exploring it further. She sings to expand it in a musical sense, instead of only as a functional classroom purpose of letting teachers know she is done. When exploring new objects in the classroom, she and her peers engage in musical behaviors together. During music time, she moves to music as she joins the group. To express her dynamic music making, she creates her own variations to the routine music activities.

Frederic the Triple Threat: Singer, Mover, and Shaker

Parents’ Lens: Musical Frederic at Home

Frederic was a trilingual, 19-month-old infant on the cusp of turning 20 months at the start of the study. In the infant room, Frederic was exposed to English. With a German father and a French mother, his environment included songs in both languages that he and his older sibling (age 4), absorbed on a daily basis. At home, Frederic’s repertoire included German bouncing songs, French chansons, children’s and bedtime

songs in both languages, some classical, and traditional songs. Musical sources at home included but are not exclusive to the iPad Nano/speakers, shakers similar to those in the infant room, an electric keyboard, and a karaoke machine with a microphone. In the home environment, Frederic's behaviors were spread somewhat evenly with listening as the most frequent behavior followed by movement, vocal, and then instrument play; communication and exploration were the most perceived functions.

The interview with Frederic's father took place in their home, a multi-level brownstone. When we met, Frederic had just been picked up from the childcare center. Strapped to the front of his father's chest and facing out, they both had a nice brisk walk on that particularly cold, snowy winter day. As we entered the front door, a friendly grey cat whom Frederic likes to lay on greeted us at the door. Frederic's family/dining area includes a carpeted play area with books, as well as a toy chest that houses a karaoke machine. The dining table was that of a rectangular solid wooden table with benches, reminiscent of a German style table. The wood panels in the room provided a sense of warmth accompanied by the natural light of the late afternoon sun, the white of the snow adding to the light. Frederic sits on his father's lap during our interview.

Moving to music for an active Frederic. Music is an enjoyable outlet for Frederic's personality. Frederic is as an active child who is happy when he actively engages in music. During the evenings at home, Frederic and his sister listen to music and dance together, as they enjoy dancing more so than actual playing. One video clip that his father shared with me showed Frederic and his sister both wearing sunglasses, dancing together while his sister sang "Twinkle, Twinkle Little Star." Moving to music, particularly dancing with others, makes him happy. His family will generally join

Frederic in dance, for example to dance the waltz, and even simply holding and twisting him provides much delight for him.

Frederic will occasionally babble musically while he dances. It was difficult for Frederic's father to discern whether it was the actual moving or singing that was more enjoyable for him. Frederic hums quite a bit, and because his sister sang, "Wheels on the Bus" often, Frederic hums this tune frequently at home. A musical device that belongs to his sister is a karaoke machine. Frederic enjoys singing into the karaoke machine immensely. Singing the syllables, "wow, wow, wow" into the microphone, Frederic sings to a background of preset beats that encourage movement. Frederic's father shared the following:

A fun thing that he really loves and was actually from his older sister is like a little karaoke machine. It has a microphone, not that he can speak or sing but he just goes to it and makes, "WOW, WOW, WOW" sounds in it. He's very fond of that. That's a lot of fun for him. It's a very repetitive sound at the thing; it's not a real song, it's just like a background beat and he always stands there with it. Yeah, I mean, just hitting the piano is fun for him, for music, and then I think the songs that come with movement with them, that's fun for him.

Songs that incorporate movement are also part of Frederic's musical repertoire at home, as it supports his need to be active. Frederic's father talks about how he and Frederic engage in a German action song.

Well this is "Hoppe Hoppe Reiter," that song he likes a lot, maybe also because we do it a lot [...] I think it's a German thing like "Hoppe Hoppe Reiter," like the person on the horse and then you do like a jump at the end, and I think that's also why he likes that sort of thing, it comes with some movements.

Due to Frederic's active nature, familiar songs that allow Frederic to join in with movements please him. However, association with familiar songs can also actively steer Frederic away from his parents, such as bedtime songs.

Dad: I always sing him the same song before he needs to go to bed, so when he now hears the song he runs away because he knows now [it] is his bedtime, so I don't think he likes the song, because he knows what it comes with.

Nita: Is it a slow song?

Dad: Yeah. It's slow. It's like the moon has risen and stuff, it's in German.

Nita: I see.

Dad: The moon is up. And my wife does the same with a French song, but I think he knows they're bedtime songs. Yeah.

The scenarios described portray Frederic dancing and moving to music with his family members, especially with his sibling. While singing accompanied his movements at times, most of his movements seem to be related to family music making, while also being exposed to different languages.

Creating musical space through instrument play. Frederic takes charge and initiates his own musical space for expression. Fond of banging on objects, he will take his shakers (similar to those at the childcare center) and bang on various objects and surfaces around the house. There is no need to persuade him to play with pots and pans, his father reported that he will take them out himself to create sounds. As mentioned, Frederic enjoys making music with the karaoke machine, and he often plays an old electric keyboard that belongs to his mother. His father talked about how Frederic set up both devices on his own in order to make music with them.

Dad: He figured out how to basically get out of this little box, the karaoke machine, plug in the microphone, turn it on and then go.

Nita: You saw that?

Dad: I say to you when we have a conversation he just puts it together and starts singing. So he knows how to do it. And he likes to do it, same with the piano. We usually would often now even unplug the electric plug, but he

figured out how to take the thing, plug it in, turn it on and then hammer on it.

Frederic's will to set up music independently involved the karaoke machine and the keyboard. While the karaoke machine provides an object (microphone) for him to sing and dance, it also allows him to create by way of selecting and *playing* the music (buttons). In playing the keyboard and "hammering" on it, both devices seem to provide him space for his music making.

Surprising musical moments. Musical moments that surprised Frederic's father entail Frederic vocalizing. He seemed to unexpectedly surprise his family by humming the themes from *Star Wars*. The particular theme is from the "Imperial March" (Darth Vader's theme). His father seemed surprised and delighted when describing this moment:

Dad: But he can pick up melodies which is fun. Like once he hummed the Star Wars theme, we were like, where does this come from?

Nita: Star Wars?

Dad: Do do do do do do (sings the theme).

Nita: Really?

Dad: Yeah. We were like, what? Where did that come from. Other times he ...

Nita: And he doesn't watch T.V. right? So ...

Dad: No, I think some other people have sung it. And the other thing he hums the most too, is "Wheels on the Bus" because his sister sings that a lot, so he's like hmmm (hums the tune of, "Wheels on the Bus"). So, he starts humming a bit. So yeah, it's true actually. He hums sometimes.

As mentioned, Frederic's sister sings, "Wheels on the Bus" often. Frederic learns and sings melodies sometimes to his parents' amazement. Another impressive moment for his parents has to do with Frederic playing melodies on the keyboard. In this excerpt, Frederic's father described a special memory of Frederic's music making. There is an

element of astonishment at how coincidentally or not, Frederic was playing melodies on the keyboard.

Dad: It's just complete coincidence, but we do these little videos for the grandparents and so he hammers always on the piano. And just by coincidence there's one little sequence where it sounds almost like he knows what he's doing. And so with a couple of, "dum-dum-dum," it's like a little melody, and like whew ... It wasn't like he knows it, it's just because it was a coincidence and random but still it's sort of memorable, because you're like whew, that was like a little melody.

Nita: And did he repeat that melody?

Dad: No.

Nita: Oh, okay. But still it was very tonal to you.

Dad: I think it was nice, that it wasn't a lot of tunes (inaudible). But there were a few that sort of made sense, instead of just, "plluh, pllluh, pllluh."

It seems Frederic makes music with the karaoke machine and the keyboard routinely, since it was mentioned a few times during the interview. While Frederic's father seemed amazed at the possibility that Frederic could sing themes from movies or play sounds on the keyboard that sound musical to his ears, he acknowledged during the interview that picking up melodies in general was something Frederic could do. When we first started our meeting, he mentioned how he and his wife were surprised that Frederic was so musical since they themselves felt they were, "both not very musical; we were joking poor kids of us. He likes music a lot, likes to dance, but his parents aren't very musical." The amazement still shone through during our discussion, that although he believes his son has musical tendencies, he is still struck with some awe and disbelief.

Music seems to speak to Frederic. When Frederic is stressed or begins to fuss, Frederic's father describes singing to him and gently shaking him as a way to soothe him. While Frederic enjoys listening to the song being sung to him, he responds by saying the

word, “more” to continue the music he is hearing. Even listening to music actively engages him to respond or to become captivated by it, to the point of seeing a different facet of Frederic’s personality. While Frederic is known as an active child to his family, he can also become mesmerized by music. In this excerpt from the interview with Frederic’s Dad, he describes Frederic taking in the musical sounds a musician in the park has to offer.

So one thing that he definitely loves is music. We went to the zoo the other day, and on the way out there was a saxophone player in Central Park under one of those arches. He stood there and looked at the guy really close for like long, long time. I have a video of it that I sent to the grandparents and they’re like awesome, so he would really like mesmerized by the saxophone and the music. He just stood there, which is unlike him, because he usually doesn’t stand very still for a long time [...].

I mean the saxophone player was the most impressive because it was cold, it was like now in the winter, it was two weeks ago. And he just stood there, completely mesmerized. (Nita: And that surprised you?) Yeah, just because he’s usually very active, and it was a cold, and he just stood there. I had to force him to continue going because his sister and Mom was waiting somewhere up already. So the fact how he was very intensely listening I think is nice. He’s usually not very still, he likes to move.

This experience surprised family members as to how Frederic was so riveted to the saxophone performance that his personality of being active in nature shifts so that we see a concentrated Frederic absorbing the music around him. During the interview, Frederic’s father showed me this moment on video. Listening to musical sounds in this case drew Frederic in so deeply that it was difficult to pull him away.

Teachers’ Lens: Musical Frederic at School

In the infant room, Frederic’s behaviors centered frequently around vocal and movement, with communication taking the lead as function, followed by exploration.

Singing during solitary play. In the infant room, Frederic is known for singing. It is not unusual for Frederic to begin singing when he is involved in solitary play. As was the case at home, Frederic's babbling is song-like that is also rhythmic in nature. As far as recognizable songs are concerned, one teacher (GA1) heard Frederic break into song on several occasions usually when it is relatively quiet in the infant room. He would sing "Twinkle, Twinkle, Little Star" on these occasions. He could also be engaged in an activity or alone in one section of the room when he begins singing. Frederic hums often at school as well as at home and does not hesitate to take control of the situation and make music on his own terms. One diary entry from GA1 described Frederic bringing the musical book *This Old Man* to a practicum student. As the practicum student began to read the book, Frederic lost interest and walked away but then took matters into his own hands.

Episode 18, Teacher Diary, 9:45 a.m. (Infant room on the carpet): Frederic brought the book *This Old Man* over to a student teacher and asked for, "more." The student teacher began reading the book to Frederic, but Frederic quickly lost interest and walked away. The student teacher put the book down on the carpet and Frederic returned, picked up the book and sat down with it. Frederic began looking at the book, turning the pages, and humming to the tune of "Twinkle Twinkle, Little Star." "Twinkle Twinkle, Little Star" appears to be one of Frederic's favorite songs and he will often hum the tune when he is alone or doing a solo activity.

The video recorded artifact that accompanied this diary entry showed Frederic holding a hard cover, "This Old Man" book, which is about to fall apart, most likely due to the heavy use of this book in the infant room. Frederic sang a fragment of "Twinkle, Twinkle", Little Star; listening carefully, Frederic sang, "up ah bawww er jeh" (up above the world so) before singing other syllables that resemble the song, as well as perhaps made-up song fragments all while turning the pages of the book, which eventually gives

away and breaks into two parts. In this video excerpt, he appeared to be alone with the book even though I heard teachers' voices and other infant voices in the background, as well as the sound of someone playing bells.

In the classroom, the infants communicate by using sign language and words. They sign and/or speak the words, "more" when they are requesting more of something, whether it be for an object or activity. They also sign and or speak, "all done" to indicate when they are finished with something, for example when they are finished with eating their snack, they usually say, "all done" to indicate their desire to get down from the snack table. The use of, "more" was also evident at home and applied to song when Frederic's father mentioned singing to Frederic when he is fussy or grumpy. At the end of the song, Frederic would say "more" to request his father to continue singing. At school, teachers reported that when Frederic requested a particular song, he would say a word from the song or gesture using his body language for teachers to understand his song request. For the song "Heads, Shoulders, Knees, and Toes" Frederic would say the word, "head" and point to different parts of his body. Using movement was one way that Frederic let his teachers know what song he wanted them to sing. In this case, the child is in control, and in an emergent curriculum/child-centered classroom, teachers listen and watch for these subtle cues.

Another way for Frederic to indicate his song request is by starting the musical sounds himself. He takes the initiative in indicating his song choice to the teachers. In another diary entry from GA1, Frederic recognizes "Wheels on the Bus" playing through the speakers. He walks towards the sound source and says the word, "more" and hums the tune.

Episode 21, Teacher Diary, 10:45 a.m: HT2 came into the classroom and plugged her iPhone into the speakers. She then put on the song “Wheels on the Bus.” Frederic walked over towards the direction of where the sound was coming from, smiling and pointing at the iPhone. When the song finished, Frederic asked for, “more” as he started to hum the tune of the song.

In this diary entry, Frederic gets close to the sound source, using gesture (as movement) and vocalization, both spoken and musical, in order to indicate his emotions and request the song be played again. These musical tools put Frederic in the control seat in order to help let teachers know what he wants. In the preceding scenarios, Frederic began by using the vocal, “more” to request songs or by initiating singing. In taking the “This Old Man” book and singing on his own, he added in his own song fragments to the “Twinkle, Twinkle” song.

Triggers to musical behavior. Many times, changing Frederic’s diaper proved to be a challenging task for teachers. He is strong enough to flip over on the changing table before the teacher can finish the task. Teachers will use song to calm and/or engage Frederic so that they can finish the diaper change. Most times it works. It seems that song was a tool teachers could use to aid in this process.

Episode 20, Teacher Diary, March 31: This afternoon Frederic had just woken up from his nap and one of the practicum students brought him over to the diaper changing station to have his diaper changed before snack. The practicum student placed Frederic on his back and he immediately flipped over onto his stomach and then started to stand up. Since this had also happened earlier in the day (and I had needed to stand next to him and distract him), I went over to Frederic again and started asking him for high fives. Frederic slapped my hand several times and then started to hum. After about 15-20 seconds of humming, the practicum student asked if Frederic was singing “Twinkle, Twinkle, Little Star”, and Frederic then started humming this tune louder, including some babbling. When Frederic went to have snack at the table, I sat next to him. Frederic started to hum the familiar tune again and this time I joined in, singing with words. As I started singing, Frederic started to drum on the table to the beat with his hands. When I paused between lines of the song, Frederic also paused. When Frederic started to tap his hands on the table, I started to sing again. This went on for several minutes. (Frederic loves this song!)

While the teacher (GA1) came over to help by engaging in high fives with Frederic, Frederic vocalized by humming a tune in order to let his song preference be known. Increasing the dynamic by singing it louder confirmed to the practicum student changing him that she understood him. While there is no indication in this entry that any of the teachers present sang with him, in most cases teachers will sing along with Frederic. This music initiation at the changing table transferred to the snack table which became a call/response type song with child-initiated drumming to accompany.

Sometimes teachers need to interpret what song Frederic would like to engage in during changing. He has a few “go to” songs that teachers will present as choices.

Episode 31, Teacher Diary, HT1 9:45 a.m.: Frederic was having a tough time with diaper changing, so HT1 went to go help [another practicum student]. He seemed to be upset because he couldn't bring his stuffed monkey to the diaper changing table. HT1 asked him if he wanted her to sing, “Five Little Ducks.” He shook his head ‘no’ and then gestured both of his hands around in a circle, like he does when he hears “The Wheels on the Bus.” HT1 asked him if he wanted her to sing the Wheels on the Bus. HT1 started to sing, and Frederic shook his head ‘no’. HT1 said, “Are you wanting me to do the verse about the people going up and down, since you seem to like that part of the song?” Frederic’s face lit up. So HT1 sang that verse to him. When she was finished, Frederic started to fuss again. HT1 said, “I know what song we can sing.... what about ‘Five Little Monkeys?!’” HT1 then sang, “Five Little Monkeys” and Frederic stayed relatively calm for the rest of his diaper change.

Here the head teacher offered a variety of songs for Frederic. He indicated to her by gesturing what he wanted. In the following excerpt, HT1 had to discern the specific verse that Frederic was requesting. With the help of clues from Frederic, she figured it out.

Sometimes I'll start off singing the song and then he'll say, “up and down.” So then I know he wants that specific verse of the song. Then other times maybe I needed to stick with that song a little longer than it would have worked, but then I'll be like, okay what other song do you sing? And he also likes *Five Little Ducks* because that book has a fish in it. (HT1)

On another occasion, the same head teacher remembered a time where diaper changing was difficult. In this scenario, Frederic sang along with the teacher.

Frederic, for instance, it can sometimes be really tricky to change his diaper. There was a time last week, I remember in particular, where the key caregiver, who's a student teacher, was trying to change him and he was squirming all over the place. So, I went over and I asked her if she needed help and she was like, "Sure, that'd be great." And so, I was like, "Frederic, why don't we sing a song?" I was like, "How about we sing 'Wheels on The Bus?'" And his face lit up. So, then I started singing wheels on the bus with him, he stayed still for the diaper change, and I got through four or five verses of it before the diaper change was over. (HT1)

The question of initiation or control seems to shift from teacher to child during this task. Song most likely was used to calm Frederic to get the diaper changing done, and perhaps at some point, Frederic initiated music making on his own during changing in order to engage in music and with the teacher. At what point Frederic took control of the initiation, it is unknown. As "Wheels on the Bus" seems to be a preferred song, this could be due to the movements that are incorporated in the song, as his father mentioned that songs with movement seem to be his preference. Singing in the classroom is also prevalent with song books, diaper changing, and solitary play.

Music gains Frederic's attention and triggers musical behavior. When Frederic recognizes a song he enjoys, he moves towards the sound source, as was described with "Wheels on the Bus." A head teacher (HT2) described Frederic as, "one that would stop and listen to the songs and start dancing to it." Along with two of his peers, Cyndi and Benny, Frederic has stopped his current play in order to listen to a well-liked song playing in the background, before moving to it with his peers. In this scenario, "Wheels on the Bus" was playing. In another scene, it was with another peer, Lily:

Yeah, the dancing. I feel like when Frederic would stop and hear the song he would start dancing and then Lily and Frederic would stop and dance. They were often just bending the knees and bobbing up and down. (HT2)

Frederic enjoys action songs, as his father mentioned. And in this excerpt from HT2, Frederic engages in applauding at the end of the song, which is something he does at home as well, after his own initiation of music:

Yeah, yeah. And then Frederic too. He hears those action songs and he's clapping his hands with it. I haven't really seen him stomping his feet but the "Hurray" song they all put their hands up for the shout hurray, their hands are up in the air. I haven't heard them shout Hurray! At the end they're like, "yeah!" (clapping). (HT2)

Sometimes the mere mention of a word that is similar to the lyric of a song will also trigger Frederic to break into song in a different context other than the changing table.

HT1: Frederic as well, he's really been into "Wheels on the Bus" and he does the hand motions to it. I've seen it ... Diaper changes sometimes lately with him have been really, really tricky. You may have seen in some of the notes I sent you that a lot of times we'll sing "Wheels on the Bus." But for instance, when we will try to get him down from the snack table or lunch, whatever he's eating, we'll ask him if he wants to get down. Sometimes that word down will initiate him to sing "Up and Down."

Nita: Oh, okay.

HT1: From "Wheels on the Bus" like the people on the bus go up and down and then he'll kind of go into the song. Which is really cool.

Nita: Does he do the motions with it, too?

HT1: The motions, yeah.

During diaper changes Frederic uses vocalizations and gesture to request songs and sometimes a particular verse to the teachers. In noticing a popular song play in the background, he stops to listen with his peers before moving to the music with his peers. A word can trigger musical behavior, for example, "down" triggering the, "up and down" lyric from "Wheels on the Bus," which puts into motion vocal and movement behaviors.

Researcher's Lens: Peeking into the Infant Room

Field observation episodes suggest that vocal and movement were prevalent behaviors with the intent of communicating with others and followed by exploration. This is consistent with the findings from episodes reported from teachers.

Singing alone when engaged in activity. During my weekly observations of the infant room, I noted that Frederic would sing fragments of songs when he is alone in his play, also while engaged in some sort of activity. As “Wheels on the Bus” is a song that Frederic sings at home and at school, he has sung the fragment, “up and down” during one instance when HT1 was heating up his food. He sang the phrase repeatedly while walking towards the mini-fridge and into the alcove of the entranceway. Later while Frederic was playing with blocks, I heard HT1 say, “up and down,” acknowledging that Frederic was continuing this fragment during his play. In another episode, Frederic was sitting on the floor with a blanket in hand while singing fragments of “Twinkle, Twinkle, Little Star.” Moments later, he continued walking around the infant room singing various pitches and later a fragment of another song, although I was not able to recognize the tune. As GA1 mentioned, Frederic will sometimes sing while doing something. I observed Frederic sweeping various surfaces with a handheld broom and dustpan. In this case, he sang fragments of tunes as he wanders around the infant room sweeping and tapping different surfaces and creating sounds with the handheld broom set.

Episode 57, Researcher Report: Frederic is now sweeping around the table next to HT1. I hear the gentle sounds of stroking of the brush on the floor. HT1 thanks him for helping to clean. Frederic brings both brushes (as there are 2 sets) over to the sofa where Lily is sitting. He gives her one, she runs with it to the floor and sweeps. Frederic brushes the seat of the mini sofa. Lily runs back to GA1, I hear a fragment of a song, maybe “Twinkle Twinkle.” As a practicum student cleans the table, Max taps his bottle on the table, with the nipple down. Frederic and Lily are making vocal sounds, Frederic is singing fragments of

“Twinkle, Twinkle.” Max is done with his bottle, and HT1 takes him to wash his hands. He is now trying to take Frederic’s broom. Frederic makes a vocal complaint, as they both pull on it. His singing stopped. HT1 tells Max that Frederic was using it. Frederic continues to sweep and sing and also makes sounds in a sing-song voice. Max is standing next to a stool and watches him. Max walks from one stool to the next as he tries to take it from Frederic again. GA1 is singing “This Old Man” to Lily, and Frederic joins; Max follows Frederic. Max checks out some other toys at this point. As GA1 continues to sing, Frederic is tapping the broom in the carpeted block almost to the tempo of GA1’s singing. Max looks at the book and stands next to Frederic, but then takes the broom from him. Frederic complains again, and HT1 and GA1 intervene.

In this episode, while Frederic is generally singing alone as he sweeps, he does come in contact with two of his peers, Lily and Max. Frederic offers a broom to Lily and later continues singing. Max interrupts Frederic’s singing by trying to take away the broom, at which point Frederic’s vocalization turns into distressed sounds, indicating his displeasure. At the sound of GA1 singing “This Old Man,” Frederic stops singing, but engages in the song by playing the broom. Frederic’s constant vocalization accompanies him during his journey around the room. He plays the hand-held broom/dustpan on various surfaces, while continuing his vocalization with peers, or stopping to hear GA1 sing.

Music at the snack table. At home, Frederic’s father reported that sometimes music would be played in the background during meals. In the infant room, I noticed that many musical moments also took place at the snack table. In one episode, Frederic waits at the snack table as the teacher prepares his snack. He begins to sing a few syllabic sounds similar to, “bih bih beh” with an interval that sounds like he is singing the motif of Beethoven’s 5th symphony. A moment later, he is hitting a stainless-steel bowl onto the table in a rhythmic pattern similar to three quarter notes and one quarter rest, with quick grace notes before the downbeat. Other times Frederic and his peers become

excited at the snack table when they are seated in their high chairs and teachers blow bubbles at the end of the day. Vocalizations of delight, tapping on the table, and bouncing are musical behaviors in response to the bubbles coming their way. Teachers will sing songs according to Frederic's request or even initiate them themselves. Frederic has responded by singing in return and moving to the song.

Episode 62, Researcher Report: The practicum student sings Row your boat (first verse), as she eats. Frederic starts to sing "Row your Boat" up to gently down the stream, and he is sitting in his chair and rocking/moving side to side as he sings. The tempo is approximately the same as the teacher's singing (quarter note to about 55-60 bpm). He maintains this phrase at a steady tempo while rocking steadily to that tempo. It is very clear; the lyrics are discernable. His pitch is right on. I cannot recall if it is in the same key as the teacher sang it, but very close. As he sang this, GA1 and the practicum student are talking about something to do with infants. I cannot say for certain, but I think what prompted the practicum student to sing the phrase was by him saying, "row row."

I can imagine a typical scenario where families sit at the table for a meal and have conversations about their day. In the infant room, music is the conversation. Here peers engage in sound making, spontaneous song, or singing alone or with others. There is something about the togetherness at the table that invites a collective jam.

Musical moments during diaper changes. As was mentioned by teachers, Frederic initiates singing while on the changing table. He might sing elongated sounds, in which case the teacher responds by singing. At the end of the song, Frederic might request "more." I also observed Frederic sing a fragment of a song, like "Twinkle, Twinkle," which triggers the teacher to sing with him. In the following excerpt, Frederic stops singing, and the teacher and Frederic end up taking turns singing.

Episode 58, Researcher Report: I hear Frederic singing "Twinkle" by himself loudly as he is being changed by the practicum teacher. When he stops the teacher sings the next phrase. They are on the floor as she adjusts his clothes when I hear him sing, "up ah" (up above) and the ST continues to sing another fragment, they do this as they finish.

As reported by teachers, Frederic initiates song during diaper changing. As mentioned, I wonder at which point in the infant room he began inviting the caregiver in to join him in music making. Turn taking in this case seemed like such a natural musical presence taking place. Such a beautifully articulated musical moment, as task becomes swift and smooth, falling into place like the musical lines as they overlapped. The rhythm and timing of this duet seemed seamless.

Music Teacher's Lens: Group Music

During music class, Frederic exhibited more movement and instrument play behaviors. Prevalent function included communication, with some exploration. There was only one musical episode that identified vocal behavior for Frederic.

Enjoys dancing with a partner. Each music time session begins with a few songs where infants can move either alone or with an adult or infant partner. At home, Frederic favors moving to music especially with a dance partner. During music time, Frederic gladly accepts me as a dance partner. Upon invitation, he extends his arms to me and allows me to pick him up and sweep him off his feet. There are times where I might simply stand next to him as I twirl him around or as we swing arms to the music. He also enjoys dancing with friends as I hold him and move him to the direction of his peers. During one particular session, Frederic had a difficult time separating from his mother during drop off, as he was not feeling particularly well. His mother was in a little bit of a rush, and as I entered, Frederic was distressed. His mother was holding him and sang "Row Your Boat," possibly to soothe him, as this was a class favorite. I invited Frederic to choose music with me on my iPhone for the infants to dance to. With his mother's

encouragement, he looked at me, smiled, and ran towards me with arms waving. As we selected songs, his mother was able to leave.

Music time starts with a few musical selections played through the speakers. During this time, I wait for invitations from infants to allow me to pick them up for a dance. Several caregivers holding infants then move to music, facing other caregiver/infant dyads. In this case, Frederic associated my iPhone and invitation to start the dance routine that leads to other musical activities. He gladly takes the offer, and he initiates group music.

Attraction to the shakers. During music time, Frederic is generally engaged for the full session. He generally waits patiently for the shakers, where I usually place them in a basket on top of the counter. While not in the data collection, I recalled that a year before, the first time he crawled was to get the shakers from the basket which I put on the carpet. He will generally wait patiently to have his turn at a musical activity. A few times, one of the head teachers mentioned that that was generally not his personality at other times. This reminded me of Frederic's father describing him as "not the real Frederic" when listening to the saxophone sounds in the park. During the presence of music, Frederic is captivated and wants to be with music.

While teachers reported Frederic singing a lot during infant play, most of his behaviors were movement and gesture-based in response to music and to indicate to me his requests. During the bouncing song "Riding on the Pony," there is a pause at the end of the song. By the sixth session, Frederic filled this pause by moving in the direction the pony would ride. During another session, Frederic looked at me and played and gestured to his instrument to request that I continue singing.

Episode 80, Researcher Report: I finished singing “Twinkle, Twinkle.” Frederic shakes his instrument, looks at me, gestures/points to his instrument. I clarify and ask him by saying, “more?” He nods his head yes. He continues to play his instrument and move to my singing.

Frederic patiently waits for the shakers and appears to always relish the moments of instrument exploration. During our group songs, he continued hold on to his shaker or instrument at hand, even when his peers were engaged in other activities like the scarf song or the singing book. Although he did not sing as often as he played during music, he remained with the group and with music most, if not all, of the classes. As reported from the teachers, there are times he sings alone. During music class, his instrument playing remains within the group.

Summary of Frederic

Frederic was described as an active child at home who is happy when he actively engages in music with others. He takes the initiative in creating a space for his musical expression by setting up devices that lead him to musical play and exploration leading to competence. His musicality at times seems to be a surprise for his parents, as well as those moments when music captures his attention.

At school, Frederic has been known to sing alone but he will engage in singing with others and gestures, for example, during diaper changes, where he communicates his requests. When singing alone, his constant vocalization seems to provide a sense of comfort, accompanying him as he explores his surroundings. Teachers reported that music attracts his attention and will trigger further musical behaviors.

Music that happens at the snack table seems to invite Frederic to explore sounds and to communicate with others. Diaper changes bring out the turn-taking (call/response)

nature of song between teacher and Frederic. The researcher view also confirms fragments of songs alone during play, as well as acknowledging that music seems to speak to Frederic, as it provides a space for him to engage in music with others. He generally communicates requests in music time by gesturing or playing, and it seems playing keeps Frederic within the shared space during music.

Lily: The Nurtured and the Nurturer

Parents' Lens: Musical Lily at Home

Lily was 18 months old at the beginning of the study. Both her parents speak and sing in English to her. Her father, knowledgeable in Spanish and Latin American culture, sings in Spanish to Lily as well. According to her parents, Lily is observant, also with her ears according to her father; her sister (6 years old) enjoys storytelling and Lily enjoys music. Along with having several books to choose from, Lily enjoys playing and listening to various musical objects at home which include a recorder, harmonica, horn, shakers, a Mozart cube, and a red Schoenhut 25-key piano, the piano that Cyndi's parents reported she plays on when she visits. At home, Lily's most reported behaviors were vocal for the intent of communication and movement for the intent of exploration.

Living in the same building as Cyndi, Lily also has access to the 10th-floor community area where there is a community piano. During our interview, Lily and her older sibling were asleep, as it was bedtime, and both parents and I situated ourselves on the carpet of the living room area. Two cats are part of the family, one was asleep in a chair near us, and the other was a vocal and chatty one purring near me. We sat in front of bookcases, a stereo system, with various toys scattered about. During the interview,

Lily's parents played music that we discussed during the interview through that stereo system, showed me videos of Lily's music making, and picked out musical toys from the collection to share with me.

Vocalizing reinforces singing. Both of Lily's parents expressed to me that they felt Lily has a capacity for music. She is able to sing along to music, matching pitch and singing within the same key. While Lily's sister has an interest in creating narratives and weaving intricate stories, Lily has, "this sense for melody and harmony—from the time she was born seemed really special." Her father described Lily as being observant,

with her ears, too. She's always trying to imitate sounds a lot. I feel it was more with her than with [Lily's sister] you would hear, if a song had been playing, sort of without knowing the words just doing the vowel sounds, but it sort of sounded like she was in tune when she was doing it.

When Lily vocalizes, her voice sounds musical, including those occasions where she is alone in the crib.

Both at nap time when she'll try to go to sleep and then sometimes in the mornings, but especially at a nap time. Sometimes we will try to put her down for a nap and she won't want to nap and she will sort off happily babble in a sing-song-y voice for much longer than we would expect her to be calm. As long as she's doing that she's okay and then at some point she'll start crying and we'll have to go in and get her. It's almost like she's singing to herself. (Dad)

Lily seems to have figured out at one point that the "ABC" song and "Twinkle, Twinkle" are the same tune. Her mother described how she would, "go back and forth between them" and with their LeapFrog device, repeatedly play the alphabet song, as she sings along to it. Towards the end of the study, the final parent diary entry indicated that Lily sang a mash-up of the tune. While it did not clearly indicate whether she was alone or with her mother at this time, Lily sang, "Twinkle, Twinkle, E, F, G" repeatedly during bedtime.

Lily does a lot of singing and music making at home alone and with her family. In early March, she sang “Canta y no llores” with recognizable consonants, which was the first time her parents heard her attempting to sing the verses of the song. With Lily, regardless of constant repetition, she never seemed to get tired of certain songs.

Episode 18, Parent Diary, 7:40 a.m: Lily responded to the Ay Yay Yay Yay song by attempting not only the vowel sounds but also the first consonants “Canta y no llores.” The c in “canta” was especially recognizable. We sang it again and she again responded with the consonant beginning of the verse and some trailing vowel and consonant sounds more or less on the rhythm and tune. Lily often imitates a tune with La La La sounds in rhythm to it, but this is the first time we’d heard her trying to do verses of this song. She’s likely heard it 10,000 times in the past 18 months, but so far she hasn’t gotten tired of listening to it. [Lily’s mom] said, “I think she knows the words.”

However, she also listens to songs quite frequently on the stereo and tries to sing along as well. While Lily started to enunciate the “c” in Canta y no llores, in the next month, she tackled a song with text that is, “wordy” and quickly paced:

Episode 25, Parent Diary, 7:30 a.m: Rufus Wainwright’s version of, “King of the Road” was playing on the stereo and she started playing groups of keys on the piano more or less in rhythm with the song. Later she wanders into the bedroom as the music shifts to Joni Mitchell’s “The Last Time I Saw Richard.” Lily babbles along with the music, trying to keep up and match the tune.

Lily’s enjoyment of singing the Spanish song repeatedly displays a will and tenacity for giving text and song justice and babbling out the rapid-paced Joni Mitchell text shows her taking on new musical challenges.

Moving and dancing ritual with parent. In the mornings, Lily and her mother have an hour of being together musically. Lily has a listening and dancing ritual with her mother, playing various genres of music on the stereo system. After dropping off Lily’s sister to the bus, Lily and her mother actively play together which usually results in dancing to music:

We've formed this little ritual where I take [her sister] to the bus. I drop her off at 7:30 and we have between 7:30 and 8:30 to play together and at lot of time that's dancing around in the morning. She likes me to twirl her around and – yeah. I just spin around here with music playing. Yeah. She has certain preferences. She likes upbeat, high rhythm music. (Mom)

Dancing will often also occur in the evenings as well. During one episode, Lily was sitting on her Rodi horse bouncing when her mother started humming the melody to the *William Tell Overture*. As she played the piece through the stereo, the energy and absolute joy that came out from Lily was overwhelming. Her mother sent me the video of it.

Episode 15, Parent Diary, 5:30 p.m: Lily was sitting on her Rodi trying to bounce. I started humming the *William Tell Overture*, and she really picked up the bouncing, so I pulled the piece up on iTunes and played it on the stereo. Lily went nuts! [Lily's sister] began videotaping with my phone, and I started picking Lily up and tossing her in the air for the high parts. We put the WTO on repeat and did this over and over again. After the third or fourth round, Lily seemed to be anticipating when the music would pick up... she'd bounce more or stand up with her arms raised, waiting for me to swoop her up into the air. We do a lot of this kind of dancing in the morning and evenings, but this was our first experience with the *William Tell Overture*, and Lily was laughing harder than I've ever heard her laugh.

During group music time in the infant room, I will very often hum the *William Tell Overture* melody at the end of a rhyme during the bouncing song “This is the Way the Ladies Ride.” When I shared this detail with her mother, she wondered if Lily recognized the melody. Regardless, the video displayed an immensely enjoyable musical moment with her mother, even anticipating the music as her sister recorded.

Lily and her mother seem to derive such pleasure during their time together listening and dancing to music at home. The vocal sounds that Lily made when seeing her mother move to the familiar overture and when her mother lifts her up during the music, and her movements on the Rodi horse display emotions of profound joy. From Lily's

responses, it seemed as if the joy represented such a deep understanding of the connection she has with her mother and the possible connection to the same tune she has heard during music time.

Requesting songs by singing and moving. Lily sings and moves to music frequently at home. She has a particular dance and vocalization that lets her parents know she is happy. When they have interpreted the song that Lily might want to hear, for example, she will perform this happy dance to let them know they are on target.

Mom: Her response when she has been understood or when she likes something that's coming is she starts giggling. She's like, "heh heh. Heh heh" She's a little bit like ... I picture her Renfield and Dracula, like this mad man assistant.

Dad: She's like so happy she cannot control herself.

Mom: Then sometimes she does this little dance with her feet, like pitter-patter.

Nita: Like sitting down or does she ...

Mom: She does that sometimes, but no she's standing up and she'll do it and she'll go, "Heh heh heh"

Dad: The happy dance.

Nita: The happy dance?

Mom: Yeah. The happy dance.

Mom: If you're like, "do you want music" She's like, "yeah yeah yeah" and then she ...

Dad: It's being understood and realizing that you're going to do something as result of that communication that she has had.

Nita: So she would communicate something- and how would she do that if it's a song?

Mom: She'd say, "pay. Pay." Before that she would go up to this and touch the glass.

Nita: Cause she knows that that's where ...

Mom: Yeah.

Nita: ... the music is going to come from?

Mom: We get to the remote and yeah. Sometimes she points to the computer too.

“Row Your Boat” was a popular song in the infant room among Lily and her peers. They would commonly request this song during and outside of music time. At home, Lily rocks along to her mother's singing, requesting a certain section of the song by singing it.

I guess just like “Row row”, row your boat. She was just in her ... We have this white rocking chair—I can show you in the room if you want. She's been getting up in it and making the chair rock, which is a new skill for her to do it rhythmically and she was singing along when I sang “Row Row Row Row Your Boat.” She likes the merrily part but she says, “May may ... May may” (sung on a descending interval). And she seems somewhat on key. (Mom)

Engaging in music with her family seems to be the norm at home, part of their home culture. By rocking in her chair, saying key words, and expressing her happy dance, Lily lets her family know her specific musical preferences, leading to joint participation in music.

Music soothes the savage Lily. In several episodes, Lily's parents sing to her. They sing often during diaper changes, at bedtime, and when they are travelling either by mass transit, with Lily in the stroller, or in a carrier. The following two diary entries depict how listening to music has an immediate effect on Lily.

Episode 21, Parent Diary, 6:20 p.m: After becoming bored or frustrated or disappointed with dinner, or with the fact that her sister was talking to [Lily's Maternal Grandmother], [Lily] shook and cried as though her soul were exiting her body. [Lily's Mom] lifted her up from the high chair and put on an Anne Murray song, “There's a Hippo in My Bathtub.” Lily calmed down immediately. As [Lily's Mom] cradled her she threw her head and shoulders back and down to look at the world upside down, laughing the whole time. Music soothes the savage [Lily]. Singing or putting on music is one of our go-to moves when she

gets cranky. In this case it seemed like the world of the song got her out of the world of whatever had been so annoying about dinner.

Episode 19, Parent Diary, 3:00 p.m: Lily cried bitterly because she realized that [Lily's Mom] was back in the bedroom working. I picked her up and held her facing out against my chest. She kept crying and shaking and I started to sing, both the "Ram Sam Song" and "Ay Yay Yay Yay, Canta y no Llores" in a quiet voice with my cheek almost touching her ear. She calmed down immediately and after a while gestured to be let down. Then she went back to playing. These are two songs I've sung to Lily since she was a tiny baby, especially during diaper changes. She seems to take great comfort in hearing them whether I actually sing the words or just hum the tune.

When Lily becomes upset, music seems to get an immediate response. When her parents put on music or sing to her it is as if her troubles pause for that moment. Holding her or being close to her in partner with music seems to provide the assurance she needs in those moments.

Teachers' Lens: Musical Lily at School

At school, vocal and movement behaviors were prevalent with communication as the most identified function.

Requesting songs by singing and moving. In the infant room, Lily requests singing from teachers by bringing the book of choice to a teacher. One usual favorite was "Old MacDonald," which had finger puppets of the barn animals as part of the book. Just as she does at home, Lily will sing parts of a song in order to request it from the teacher. GA2 shares Lily's strategy in this interactive activity, "Lily will ask for it by singing parts of the song and she will say some of the names of the animals, so you can make the sounds." Sometimes new practicum students in the infant room might not be familiar with certain children's tunes. Lily is patient, and HT2 describes how Lily remains insistent in her song request.

I mean I definitely feel like she was really into reading all of the- Or singing all of the other songbooks. She liked the “Ants Go Marching.” ... The Duck book as well. She was doing Itsy Bitsy Spider. Oh, the nursery rhyme book, that’s in there that has like all the different nursery rhymes to sing. She made sure, she wanted everybody to sing it and some of the new practicum students had no idea, some of them, of how to sing some of these songs, but she was like, “No, no you gotta sing it.” She just really kind of ... She sat in their lap, nestled really nicely into their lap and then you know, was waiting for the songs to be sung to her. (HT2)

Lily will sing or move as ways to let teachers know her wishes. GA2 described how Lily will stare at teachers with a smile, almost as if the stare would translate her needs. If that does not work, she will engage in the behavior to start it off, “I’ve noticed that she doesn’t sing while you’re singing, but when she requires you to sing, she will sing.”

In the classroom, “Row Your Boat” was one of the most requested songs of the infants. Even when there was a time when the song phased out, Lily re-introduced it one day into the infant room. Along with singing, she will move or use gestures to let others know her wishes. She engages in her, “happy dance” at school just like she does at home to let her teachers know when she is excited about something. Saying, “more” or gesturing parts of a song like “Heads, Shoulders, Knees, and Toes” were other ways to ask for a song. She also reenacted the boat scene to get her message across.

I think when they come to us or Lily saying the, “row, row” — she connects that with adults, but she’s the one initiating it and thinking about wanting to sing that song. For example, we had the boat in the classroom, she will go in and started to sing, “row, row, row, row” and she will look at you like, “can you sing it for me?” She could not sing the whole thing, but she’s the one initiating without an adult near her, but she will look at adults. (GA2)

As she does at home, Lily specifically lets her teachers know her musical requests. If they are unsure, she will wait patiently until they understand her. For practicum students in the classroom who might not have been familiar with certain songs for children, Lily’s initiation, patience, and musical cues help them along.

Music in play. “Row Your Boat” will also find its way into Lily’s play. The *Row, Row, Row Your Boat* book (extended version) used in the infant room was introduced by HT2. This version tells the story of a family of bears, as they row in their boat through an adventurous experience. This was also the same book that I have used in toddler music classes, where HT2 was previously a head teacher. She brought this book into the infant room and the infants would get into a hollow wooden platform, as their boat, and follow along, sing, call out words, and rock throughout the boat ride. For Lily, reenacting the scene by being in a boat has been used to request songs, but sometimes she engages in musical play in this way during self-initiated solitary play.

GA1: So, Lily. Nobody has to be watch, per se. Even if I see her out of the corner of my eye, she’ll just dump out a basket of toys. She’ll sit in the basket and she’ll start singing, “Row, Row.”

Nita: Really?

GA1: Yeah. I mean, she doesn’t know all the words, but she’ll be humming a little bit.

Nita: On her own? Like no teachers.

GA1: On her own. Yeah.

Another song that the teachers have brought to the attention of Lily’s parents is “Baa Baa Black Sheep.” Lily’s sister also attended the same childcare center where she began in the infant room. The song that teachers sang to Lily’s sister as an infant was “Baa Baa Black Sheep.” Because HT1 remembered this, she sang this song to Lily as well. Consequently, her parents had forgotten about this song and it became a song that Lily requested at bedtime.

What’s been interesting with Lily is the same teachers at [the childcare center] had [Lily’s sister] and they remember the songs we sang to [Lily’s sister] and we forgot them so [Lily’s sister] always ... She would only sit to have her diaper

changed if you sang “Baa Baa Black sheep” and so they were singing “Baa Baa Black Sheep” to Lily. I had completely forgotten about that and she started asking for it all the time so we started singing that. Now that’s what she has to have before she goes to bed. (Lily’s Mom)

In the classroom, HT1 recalls, “and ‘Baa Baa Black Sheep.’ She loves ‘Baa Baa Black Sheep.’ Which is interesting because her sister—that was one of her favorite songs during diaper changes.”

Lily’s parents referred to Lily’s clear consonant “c” when singing “Canta y no Llores.” Another diary entry recorded her babbling along to Joni Mitchell’s “The Last Time I Saw Richard,” with fast paced and plentiful lyrics. During our second interview, HT1 talked about how Lily’s musical behaviors has evolved over the course of a few months since our first interview and relates it to language development.

I feel like overall naturally with the kids their language development kind of unfolding, they’ve become a lot more verbal. Whereas sometimes they would just hum or babble to the tune of different songs, now they’re actually saying the words, which is really cool to see. For instance, Lily is really into “Baa Baa Black Sheep.” I would say she’s got about half the words to it, and she’ll sing it kind of randomly throughout the day or particularly when she’s playing in the midst of baby doll play, she’ll want to sing “Baa Baa Black Sheep” to the baby that she’s taking care of. (HT1)

A diary entry from GA1 paints a mini portrait of Lily taking on the role of caregiver to her doll.

Episode 36, Teacher Diary, 10 a.m: Lily picked up a baby doll and placed it on top of a blanket that was on the floor. With the practicum student’s help, Lily wrapped the doll up in the blanket. Lily then began to sing the first several words of “Baa Baa Black Sheep,” as she comforted her baby doll on the rug. (GA1)

Lily asks for songs and does not seem to tire from the repetition. She brings songs into her solitary play. In finding another resource that could be a boat, a basket, she reenacts the boat sing as she sings the tune. She sings “Baa Baa Black Sheep” to her baby doll. In

these moments, she applies song to different objects, while learning about the world around her.

Researcher's Lens: Peeking into the Infant Room

During field observations, vocalizations were the prevalent behaviors, with communication being the most observed function.

Singing during diaper changes. During my interview with Lily's parents, her father shared with me how they had been singing to Lily during diaper changes since she was a young infant. During a classroom observation, Lily's father came in to pick up Lily. While he was there, he changed Lily's diaper. While I could not clearly determine who initiated the song "Ram Sam Sam," it seemed that Lily's father immediately began singing during the changing.

Episode 62, Researcher Report: Lily's dad is heard singing, "lala" from the song as he lifts her and bounces her up in the air a few times. Changing is done. He puts Lily down. She is at the trampoline and sings, "la la" while he talks to other adults in the room.

Lily's father had expressed in our interview how music was their "go to" with Lily and during one diary entry, he wrote how music soothes the savage Lily. I saw this happen in the infant room during another pick-up. As he prepared to leave with Lily, she became extremely upset. She instantaneously stopped crying as soon as her father started singing to her. I was not able to discern which song it was, but it was in a slow tempo. She was soothed, and she said goodbye to the infant community and they set off.

Lily has initiated and vocalized soft sounds, elongated sounds, staccato sounds, fragments of songs including "Twinkle, Twinkle," various syllables, and recognizable intervals like perfect fifths, including one observation when I heard her sing a descending

perfect fifth before moving to a lower note and singing yet another descending perfect fifth. She did this three times in a row, a sequence of perfect fifths which stopped when the diaper change ended. Generally, after being changed, Lily resumes her play. As “Row Your Boat” was a prominent theme during that period, Lily had her diaper changed in between moments of reenacting the boat scene:

Episode 60, Researcher Report: GA2 just brought a waking Lily from the nap room. As HT1 changes Max, he is crying, and Ashlee is also crying on the floor. Lily watches them. Benny is walking circles around the eating table. It is a duet of cries from Ashlee and Max. The intervals of the cries (they are tired it seems) are different pitches and their sounds start blend into the same pitch. Lily is now inside the wooden platform and says, “woh woh woh” as she observes the crying baby. The crying at this point begins to subside.

HT2 takes Max to one nap room, another teacher takes Ashlee to the other. GA2 takes Lily to change. Lily makes soft sounds at the changing table, and Benny continues to walk around as he makes his babble sounds, and a downward siren sound. As Lily is being changed, she starts to sing fragments of a song. GA2 asks her if she is singing a particular song, the name of which I could not hear.

After, Lily immediately goes to HT1 and says, “woh woh,” HT1 then holds her hand and does rowing motions with Lily. Lily immediately goes to the inside of the wooden platform and sits in it; Benny joins her. HT1: “Where are you going?” HT2: “In her boat.” Lily sits there and says, “more, more” frantically. HT2 hands HT1 the book, and she reads and sings it to Lily and Benny as HT1 rocks the boat. At the end of the song, Benny goes to the trampoline. Lily pulls another book that is in the platform and hands it to HT1.

This scene shows how Lily informs HT1 that she wants to play out the boat scene. HT2 knew exactly what Lily was requesting, as HT2 sang the book earlier while Frederic, Cyndi, and Lily acted out the boat scene. The diaper changing was a moment in between Lily’s “Row Your Boat” request for Lily to continue her musicality. It is possible that Lily had the idea to start “Row Your Boat,” as a suggestion for the two crying babies, Ashlee and Max. Although, they had already retired to the nap room, Lily followed through her idea, with Benny by her side.

Music in play. In my observations, Lily took on the role of caregiver with a doll during her play. I saw her lay down on her back, hold the baby doll while swinging her baby above her, while singing. During one scene, Lily changes her doll's diaper.

Episode 72, Researcher Report: Lily picks up a baby doll. She says, "Lily bay-bee" twice. GA1 says, "Lily is changing the baby's diaper?" ...

I hear "ro ro" on the same pitch. GA2 who is sitting across from Cyndi on top of the upside-down rocker asks, "Are you singing, 'row row row your boat gently down the stream?'" GA2 sings that part of the song. GA1 reads from a book, "Red wolf red wolf what do you see..."

Cyndi sits on GA2's lap and starts to rock side to side singing, "row row." GA2 picks her up and says we can sing the song while you get changed. She takes her to the changing station and changes her. GA2 sings the first part of the song.

Lily puts her doll on top of the rocker and begins singing a song.

After Lily changes her doll's diaper, she places a doll on the rocker which might have been influenced by Cyndi's initiation of "Row Your Boat." This scene depicts one of many occasions of how music happened simultaneously in the infant room and the possible shared influences that are musical.

The teachers will add and take out objects in the infant room depending on the interests and development of the infants. During one period, a mini trampoline was placed in the infant room, with pillows placed on the carpet surrounding each side. The trampoline seemed to be a strong attractor to all the infants. There is a bar where infants can hold on as they stand themselves up on it, while they balance. It seems that the mini trampoline invites infants to make music. I have seen infants bounce on it while vocalizing, and in particular, Lily would hold herself up on the trampoline bar and sing song fragments. During one observation, Benny sat next to Lily on this occasion and vocalized with her. The following scene shows how Lily returns to the trampoline a few

times, bringing song books and vocalizing various sounds. At the end of the scene, she continues and carries her vocalization to the snack table, indicating that she is hungry.

Benny has joined Lily again with his own instrument play and vocalization.

Episode 57, Researcher Report: Lily says, “wow” and walks towards the trampoline, and Benny returns to the trampoline and again beats the sticks he has in his hands. At this point, Lily brings the Old MacDonald puppet book to GA1. GA1 sings the book to her, I hear Lily respond with, “quack, quack.”

HT1 sings “Old MacDonald” to Benny, as he holds the puppet book. He is engaged with the book. GA1 is reading a book to Lily and Ashlee is near them on the trampoline. It is a book about body parts. On the left side of where I am sitting now on the carpet facing the sink, HT1 is on my left with Benny singing the “Old MacDonald” song, and on the right side, GA1 is reading her book. Now, Lily is standing on the trampoline and singing soft sustained sounds.

To my right, Lily repeats the sounds, “deh dee kee tah.”

To my left, Benny holds the puppet book, and makes various sounds, including, “la la,” head voice sirens, “doh”; he walks over with the book and brings it to the trampoline with Lily.

1:38 p.m: Lily is standing on the trampoline and continues to sing elongated syllables, “dooo baaaa jaaa.” She brings the book back to GA1, and she continues reading, “here are my hands...”; GA1 reads in a very sing-song place in her voice, pleasant ascending and descending phrases as she reads the book (slides up and down). If I could draw what her reading sounds like, it would look like continuous waves of peaks and valleys.

As Lily walks with toy keys, she sings fragments of what sounds like, “kuuuu, baaaa, jaaa” while shaking the keys. She wears a tape roll on her wrist and approaches GA1.

Lily continues to the trampoline, sings long tones, then short tones, “kee tah” a few times. Lily makes her way to the table, continuing in a forte, “taaaaa taaaa taaaa” and, “waaaa taaaa taaaa.” HT1 asks her. “Do you want to have snack?” Lily replies with a faint, “ya.”

The infant room teachers will change the set up and materials of the room depending on the interests of the babies and their level of development. When baby dolls were part of the room environment, Lily brought song into her play with a doll and shared her musical

preferences with her; it seems like she is simulating the intimacy and care she herself receives from her parents and teachers. The presence of the trampoline seemed to invite her and her peers to engage in musical behaviors. In this case, Lily's vocalisms varied in syllables, vowels, and song fragments.

Music Teacher's Lens: Group Music

Lily displayed vocal, movement, and instrumental behaviors during music time. Communicating with others was the main function of these behaviors. The following describe Lily engaging in musical behaviors as a way of communicating with others, in this case, our music group.

Singing while playing during group music. Lily sings frequently during weekly music. I usually bring in instruments like shakers and other percussion instruments for their exploration. Playing instruments to songs that we sing would generally invite Lily to play and sing fragments at the same time. During "Shake and Stop," infants would shake their shakers and stop on the musical cue. Variations include, tap and stop, shake high/low, shaking at faster or slower tempi, which are all dependent upon an infant's leading gesture. During tap and stop, Lily has joined in the activity many times by tapping her instrument on the carpet or with both shakers tapping each other, while vocalizing the words, "tap tap tap." During my observations, the teachers in the classroom will say, "tap tap tap" when an infant taps on something in the infant room. Here, Lily applies this to our tap and stop variation. Often times, "Row Row" is highly requested along with "Twinkle, Twinkle" during instrument exploration. In the following music time observation, Lily initiates singing "Twinkle, Twinkle" when exploring bells and finger cymbals.

Episode 84, Researcher Report with Video Timestamp:

20:27 Lily sings, “how I wonder...” while holding the bell with a huge smile.

20:45 Lily sings again, “how I wonder...”

Lily holds a finger cymbal and sings a fragment of “Twinkle.”

21:30 Then she says, “up above, up above” as the fieldwork student fixes the loop attached to it.

21:53-22:09 Lily sings the words loudly.

22:05 Ashlee singing, “up above.”

22:30-23:31 Lily continues singing around and with the fieldwork student. The fieldwork student takes the bell and starts to tap and sing, and taps the shaker against it, then Lily taps the shaker and bell together as she sings.

24:26 Lily taps and says, “stop” during the song.

24:45 Benny is in the back, tapping other objects.

24:51 Lily sings, “how I wonder” very loudly and holds onto both arms while shaking the shakers.

25:49-26:10 During tap and stop, Lily takes them from the fieldwork student and sings, “tap” as she taps.

During this segment of the music class, the time stamps follow Lily’s sequence in singing and playing instruments while making connections to song fragments of two different songs. The fieldwork student, one of the music students who worked with me that term, was Lily’s musical partner during this scene. At one point, Lily controls the musical activity by saying, “stop,” as she leads the activity with the music student. In music class, singing is a prevalent behavior for Lily. Often when I sing “Twinkle, Twinkle,” Lily will enter by singing, “up above” matching pitch with me or sing it before I do on the corresponding pitch. In the following episode, Lily matches pitch on cue while moving the hand drum to the beat.

Episode 90, Researcher Report with Video Timestamp:

22:19 On cue, Lily sings, “up above” on the same pitch. And she moves her drum in her hand to the beat as she sings. She continues playing as she walks away, gives another teacher her hand drum.

22:54 As we start to sing the song again, Lily runs back and gets her drum, starting us off with a beat for me to sing. She sings, “how I.”

When Lily returns with the hand drum, she leads the song by tapping on her drum, and I follow her tempo.

Ways of requesting during music time. Just as during play time in the infant room, Lily requested music by gesturing, for example, inviting adults to dance by holding her arms out to the adult, saying a particular word to indicate the song verse she is requesting, or saying “more.” GA2 mentioned that Lily has a particular stare when she wants to communicate her request with teachers. We use a scarf during a “Peek-A-Boo” song. In this activity, we place a scarf over a child’s head as we sing, “where is (insert infant’s name), wish I knew, pull down the scarf and say (pause here for child to pull down the scarf), peek-a-boo!” Either the child under the scarf or another child or adult will usually pull the scarf down during the pause of the song.

Episode 87, Researcher Report with Video Timestamp:

20:06 Frederic lets me put the scarf on him, Benny takes it off and says, “ooh” in his voice to him.

20:33 Benny puts the scarf on Lily (I thought he wanted to put it on himself), Frederic pulls it off. Lily says, “more”

21:25 I hear a fragment of “Twinkle Twinkle (Ashlee). Other infants are having turns. Lily wants to have a turn; Benny holds on to the scarf. She approaches him and waits patiently. She had expressed to a teacher a moment before by gesturing to her head. She eventually goes over to Benny and says, “mine!” since he is not giving it to her. GA1 tries to take it from Benny, and he protests vocally, and he tries to leave the group with scarf in hand. GA1 eventually takes the scarf and puts it on Lily’s head.

GA1 and I both invite Benny to pull down the scarf from Lily. We sing the song and during the pause, no one unveils Lily. GA1 is looking in Benny's direction. Lily waits for someone to pull down the scarf, as no one does, she walks closer to GA1 and looks at her through the scarf.

25:03 GA1 is looking at Benny and does not notice. Lily then moves until she is face-to-face with GA1 and eventually pulls it off herself. We all laugh, including Lily. Benny quickly gets the scarf and runs to the other side of the room with it.

This particular stare did not take too long before Lily initiated the musical activity herself (pulling down the scarf). Just as she had done during infant play, when providing the source (like a song book) or staring at the teacher does not get her message across, she will engage in the musical act. In this case, she ended up following through to the end of the activity.

Play in music. During group bouncing songs, teachers in the classroom each have a baby in their lap. I begin singing, "This is the way the ladies ride, side to side" and continue on with different phrases and different directions for teachers to bounce the babies. I end with singing the tune from the *William Tell Overture*, which is the very same one that Lily and her mother danced to during their music ritual. Before singing the tune, I chant, "this is the way the babies ride," and then I pause in case a baby wants to contribute a direction to bounce. During one episode, upon saying, "this is the way the babies ride," Lily, who is in my lap bouncing to the song, points to a cradle and says, "ah bay-bee reeee." We finish bouncing to the tune, and she gets up to bring the baby doll from the cradle to have it join the music activity.

Episode 78, Researcher Report with Video Timestamp:

10:34 Lily walks back into the group with the baby doll in hand.

10:45 Lily brings the doll to bounce during bouncing song, and sits in my lap, as the doll sits in hers. We sing the song again, this time with the baby doll.

From what teachers reported and from my observations in the infant room, Lily sings to her doll or moves her doll, bringing music into her play. In this episode, she includes her doll into our group, from the play world into the music world, while she maintains her role as doll caregiver.

Summary of Lily

At home, Lily sings alone and with others often which subsequently strengthens her singing and language skills. She seems to comfort and entertain herself when singing alone and possibly to explore her vocals further. Dance rituals where Lily spends time listening to music and dancing with family members provide a space for shared emotions, while also possibly making a connection to music class at the childcare center. Lily expresses her song preferences and whether her needs have been met through her musical movements and vocalizations. Music has such a soothing effect on Lily that she immediately responds to it in times of distress.

At school, Lily also requests songs by singing fragments or using movements and she leads her teachers into participating. She applies songs to different contexts as she explores and learns about the world around her. Field observations showed Lily engaging in song during diaper changes and extending it afterwards by inviting others to join in her musical play. The environment in the infant room, which changes according to infant development and interests, seems to invite musical play behaviors. During group music, Lily engages in musical behaviors to communicate with others and brings in objects from her infant room play into our music group, including others into the group while expanding the musical experience.

Benny: Mr. Timbre Man

Parents' Lens: Musical Benny at Home

At the start of the study, Benny was a 15-month-old infant with an older sibling who attended preschool in the same childcare center. I facilitated weekly music activities into both Benny and his sister's classes. Both parents are English speakers with some musical experiences. Benny's mother sang in her high school choir, and Benny's father has experience playing the viola, trumpet, and a little bit of guitar. Benny's sister enjoys musical activities, especially dancing. At home, Benny's behaviors were spread somewhat evenly between movement, instrument play, and vocal. Communicating and exploring were his top functions. Movement behaviors were associated with communicating with others and instrument play behaviors were associated with exploration.

Upon entering their home, we entered the children's bedroom where Benny's sister was hiding. Her bed and Benny's crib are on opposite sides of the room, and there is a shelf of books and toys. After Benny's sister popped out from under her hiding place, the crib, we settled into the living room where during our interview, the children would play with various toys, as well as move back and forth between the bedroom to bring in more objects, books, or toys. Benny explored with various objects, making sounds with them, and vocalized throughout the interview.

Dancing at home. Benny's sister was responsive to music as a young infant. Her parents would put on music and dance with her at 3 months old, which immediately calmed her. Her parents found music had an immediate effect on Benny's sister who was colicky as an infant. She has a strong musical influence at home due to her high energy

and enthusiasm for music, and she especially loves dancing. At home, Benny's parents will play music in the evenings for the children and during bath time. As far as choosing music to play, it would usually depend on the interests of the children, usually the interests of Benny's sibling.

Mom: Yes, I would say at night it's something we use as a family, for fun. We put on some songs, usually driven by [Benny's sister] to dance to.

Dad: Yeah, [Benny's sister] loves to dance.

Mom: And we'll put it on during the tub. They were dancing in the tub yesterday.

Her father recalled being at a restaurant where she had the need to dance, as a way to let it out.

Mom: It's mostly stuff that [Benny's sister] likes. She really has gotten into Spanish music, too? Over the summer, she just started doing almost a flamenco dance one time, when she heard the Gypsy Kings and so, we like. We didn't know where that came from at all, so we thought "Okay, this could be fun" so we signed her up for Ballet Hispanico and she's been loving that.

Dad: I've never, I mean I'm not a dancer, I've never seen somebody who ... we were at a taco restaurant and there was somebody on stage, and she just stood up and said, "Dad, just gotta dance!" And everybody in the restaurant was just like, "who is this little girl and where did this come from?" I think it's fun seeing both of them get excited about songs and want to hear specific ones.

Nita: So, in that particular event, was Benny there, too, when she just had to get up and dance? What was his reaction? Do you remember?

Mom: I don't think he was paying attention much. It was six months ago, so ...

Dad: But now, when she dances, he'll get up and he'll smile and start. And she tries to dance with him, he tries to dance with her, but, they're still figuring it out.

Benny's sister's drive for music is infectious, and the relationship he has with her is a closely connected one. It was hard for his parents to tell whether Benny's responses to music were directly influenced from music or his sibling.

Dad: I don't know that we put music on specifically for him. I don't know if there's a type of music that he gets really excited about when you turn it on. He wasn't colicky, so we didn't have the same experience in needing to do that.

Mom: He hasn't been as reactive to music.

Dad: As she (Benny's sister) very much, obviously, was. (Mom: Yeah.)

Nita: You could see that straight away?

Dad: Yeah. As soon as ... he usually likes it when you sing.

Mom: Yeah. And he was dancing in the tub?

Dad: Yeah. But I don't ... I guess, we don't know if he gets excited because he loves [his sister] and loves doing whatever she's doing? So, it's hard to tell if he's excited about the music? Or is he excited because she's excited and he wants to participate.

It seems that the musical environment that surrounded Benny was facilitated by his parents according to his sibling's musical interests. This seemed to be the case, as they associated his sister with being responsive to music since she was colicky as a child, and therefore used it as a tool to soothe her. It seems Benny's musical behaviors were not as overt alone, and he appeared generally happy to go along with his sister's musical preference, and his behaviors, as in all children, are different.

Playing objects for sounds. Benny was fond of banging. His father reported that before I arrived for the interview, Benny hit toys together creating different sounds, while the family picked up toys around the apartment. At other times, his father described Benny playing the tambourine as, "kind of making it a drum." It seems that during his

exploration of playing, he found a different way for the tambourine to make sound. One of his favorite objects was the triangle, and the following episode describes how Benny attempted to understand how to create certain sounds with objects, in this case the triangle and measuring cups.

Dad: The music set that we have, he will definitely pull it out periodically and check each thing out. I think the thing that we probably hid was the triangle, which was his favorite thing, but it was just really loud.

Nita: Really?

Dad: But yeah, he loved holding it and hitting it. And then I showed him how it makes a different sound when you hold it from the string, it rings more. And he thought that was really interesting and then he tried to do it. And then he'd hold it, and do it again, and be confused as like ...

Nita: So, it was like through his look ...

Dad: He was trying to figure it out, and he didn't get why when he held the thing and hit it, it wasn't making the same sound as when you hold it by the string. It was just ... He has a very expressive face, I feel like. So, it was just interesting seeing him try to work it out.

Mom: Any measuring cups, he would play music that way.

While Benny might accompany a song by playing along to it with an instrument, he seemed to enjoy creating sounds through his percussive playing of objects and instruments to see what sounds arise. He also becomes involved in figuring out how to create sounds with instruments, as his father models the technique. There was another instance, where Benny studied his father and tried to articulate the gesture of snapping. In the case of instrument play, he was trying to gain competence by sustaining a tone on the triangle.

Vocalizing for sounds. Benny vocalized various sounds throughout the interview. His parents described his vocal sounds as sing-songy, and when he sings along

to a song that is playing, his parents were able to discern that it was singing, even though his dad described that it was, “not like necessarily on key, or the right notes, but he was like, singing along with it.” In singing with others, there was particular way that he sang the syllables “la la.” He sang these syllables conversationally with a partner, taking turns.

Mom: Even on FaceTime last night with my mom, he was like, “La, la, la, la, la, la, la”. He was doing that back to her. Wait, do you do la, la, la? Benny, can you say la,la,la? You did it yesterday!

Benny: La, la.

Mom: Yeah! La, la, la, la, la, la, la. Your turn!

Benny: La la la

Mom: Yeah. La, la, la, la, la, la, la. So, yeah. That’s the sound of it. La, la, la, la, la, la, la.

Nita: So, tell me about his routines now. What does-

Benny: La, la, la.

Mom: La, la, la? (Benny: makes vocalizations followed by sound of applause)
Yay!

Benny enjoys his discoveries of new sounds in general, for example, snapping, which he has tried to figure that out with his father. In vocalizing, he learned how to make popping sounds and another unique sound, which can be created wiggling your finger on your lips. In Benny’s case, the tempo and dynamic of this particular vocalise would express his mood at that current moment.

Dad: I don’t know if it counts, but he loves clapping and making noises and (dad makes popping sounds with mouth) and doing stuff like that. Sometimes with songs, sometimes without.

Mom: Or even like at a very young age that video of me going (unique vocal sound) and him repeating.

- Dad: That was his way of communicating for a while. He had had different [vocal sounds], different tones and different speeds. Really fast and loud was like, "I'm angry."
- Nita: Oh, interesting! Tell me more about that. So fast and loud was angry?
- Dad: Well, it started off and it was just a funny thing that whenever we would do this with ourselves, (vocal sounds), or we'd do it to him, he would sing, obviously, when we'd do it. Then, I don't know if he thought, at first, that's how we talk, and he picked up on it and he would ... Like if he were just playing, he'd be like [vocal sounds]. Kind of babbling and doing it. (Benny imitates vocal sounds)
- Dad: But if it was the end of the day, he'd be like, (louder version of vocal sounds).
- Nita: Oh, wow, is that so Benny?
- Dad: And he would tell us, "I'm not happy right now."
- Nita: But otherwise, other than that, it was just he ...
- Dad: He would do babbling, he would do ... (Benny makes the vocal sounds)
- Dad: Yeah, like that.
- Nita: So, he's not angry there?
- Dad: No, no. It's happy. It's happy. (Benny makes vocal sounds)
- Dad: Yeah [...]
- Mom: This is July, a long time ago (audio of video clip heard)
- Dad: Yeah, this is ... This is when he's first learning how to do it. He got much more refined.

According to this episode, Benny was happy making his unique babble during our talk. Towards the end of the interview, I showed a few video clips of Benny during group music time. His parents seemed delighted to see and hear Benny in the context of music class and somewhat proud and pleasantly surprised at his overt musical behaviors. The element of surprise from Benny's father and the amount of reference Benny's sister

received during the interview seem to indicate how much they base their standard of musical behavior on the older sibling. She became the marker not only for a high level of musical responsiveness, but in some ways the best example of how a musical person might behave. In comparison, Benny is not as outwardly musical in the traditional sense, yet he also became part of his sister's musical world, as he expresses himself through his unique musicality. Because he and his sister appeared closely bonded, Benny's excitement for musical activities was immediately triggered due to his sister's enthusiasm.

The tempo and dynamic of Benny's vocal sounds determined his current mood or state, as was described in his musical babble. These sounds, even during the interview, depict his emotions. The use of, "la" as part of a call and response type conversation whether on FaceTime with his grandmother or his interjection during the interview, in these cases, were encouraged by his mother who indicated it was his turn. The nuances of this interaction depict the back and forth actions between partners, the intonations and peaks and valleys of the, "la" sounds, and the in between pauses.

Teachers' Lens: Musical Benny at School

At school, Benny's behaviors ranked in the following order: vocal, listening, instrument play, movement. About half of his vocalizations were coded as undetermined, and the remaining spread evenly between communication, exploration, and comfort.

Vocalizing in the nap room. Teachers reported that Benny had some very unique musical sounds that he engaged in at school. One teacher stated that she had never heard these sounds before from another child. It seems to happen when he is alone in the nap room before going to sleep, although he vocalizes during diaper changing at times.

Benny also made these sounds in the nap room upon waking. According to one teacher, the sounds are musical in nature.

For sleeping, Benny do those sounds, sounds like music or some rhythm that's self-soothing for him, but also when he's doing the other things. Even when you're changing his diaper, he will make those sounds. (GA2)

To the teachers' ears, Benny's vocalizations are unique. One teacher described his pre-sleep sounds as musical with an, "interesting range of tones." Described as, "whale calls" by his teachers, they have heard these sounds in the nap room and later in his play in the infant room. In asking about how Benny is musical, these unique sounds were the first behaviors that teachers described.

He makes these awesome sounds like whales. His caregiver last year called them whale calls and they totally sound like whale calls. And they're impressive. He'll do it in the nap room when he's going to sleep or when he's waking up. We've also noticed we've heard him more in the play now. (HT2)

The sounds seem to vary in range, from low to high. Later in the study, as it seemed to extend more into his everyday play, the sounds also seem to take on different characteristics.

HT2: It was like (the sound of HT2 making pitched sounds in her voice).

Nita: That one too because he made the — (the sound of me making low pitched sounds and making "wooh" sounds)... I can't describe it all the time, but it was something like that.

HT2: I felt like he- It would often, lately his whale calls would only be in the nap room. Then it started that we heard more of them outside.

Nita: That's what I'm wondering.

HT2: So then when they were outside they were different, they sounded differently...less grunter and more of the one that you're talking about.

Vocalizing with peers. The nap room, "whale calls" that the teachers described imply that Benny was alone when making these sounds. In one episode, a teacher

described music making between two infants who were awake in the crib room.

Spontaneous song seemed to emerge upon waking and signaled later to the teachers outside in the infant room when they are ready to come out. In the following excerpt, HT2 described how infants engaged in singing together in the nap room.

HT2: Often when they're awake in their nap room and we haven't gotten them out yet. They're like talking to each other and singing to each other.

Nita: Even if it's more than one, or alone even?

HT2: No, it would often be like Frederic and Benny. You'd hear them, they'd start to babble, they'd start to talk, then you'd hear like a song.

Nita: Just some made up song?

HT2: Yeah, and then they would start shaking the crib and we would be like, "Okay, yeah. When two of you are shaking the crib it's loud, it's time to come out."

Benny and Frederic frequently interacted with one another. They engaged in play and in conflict as well. This excerpt does not provide information on which child initiated the vocal behaviors. However, both infants engaged in a high number of vocal behaviors. In more of a group setting, the following episode depicts Benny initiating a vocal behavior with an object, and in response; his peers also join him.

GA2: One time I remember this anecdote, it was Cyndi, Lily, and Benny and even Ashlee came, they were playing with some pop beads or I don't know. They had some holes, like connecting cubes or something, and they will hold them, and they will do a sound (lip trill) with the toy in their mouth. They all started to do the same thing and it was like a whole sounding ...

Nita: Really? Who was it?

GA2: It was Cyndi, Frederic, Benny, and Ashlee came too, but I have that note that I can clarify who it was.

Nita: Oh, wow. Okay, that's cool. They did it for some time, like a minute or something like that? They were really into that?

GA2: Yes. Yes. They were really into that.

Nita: They were all at the same time?

GA2: Yes. The oldest started the sounding, I think it was Benny who started and then they all grabbed one and started to do the same thing.

From this excerpt, it is hard to say whether Benny or the others had discovered making this sound before, or if this was the first time. If it was the first time, it would seem as if Benny's natural vocal self along with his exploration of the object invited others to try it out for themselves. If Benny had made this sound before, his initiation triggered the others to join in in their collaborative music making. In either case, these infants were quick to interact with this sound and with each other. In this classroom, these infants were described as being more social in nature, and generally if one infant started an activity, the others would join.

Listening to songbooks. There are plenty of song books to choose from in the infant room. If a child brings a song book to a teacher, she will read/sing the book. Considering the social nature of these infants, reading song books was another way that infants got together musically. Benny enjoyed listening to books and likely joined others during this activity to be a part of the group, as described by GA1. HT1 reported that Benny usually joined his peers during song books, but rarely did he actively engage in the book like some of the other infants would. He was able to sit through this activity as he has the attention span for it, and HT2 reported that, "he'll do it by extension, if all the other kids are doing it he'll do it." Towards the end of the study, HT2 reported that Benny would request song books on his own.

He was also one that I felt like when you first asked this he wasn't necessarily going for the books that had the songs in it. I mean he would go along with the

Row, Row, Row Your Boat and stuff like that but he's definitely been handing us more the songbooks to sing with him. (HT2)

It seems that Benny likely joined his peers during song books, as a way to be with the group. While he may not have actively engaged in the song books being read, he seemed to somehow still be taking in the music. In this case, he might have been building up a song book repertoire, listening along to the various stories to develop his own taste. At home, his musical behaviors were not as pronounced as his sister's and during song book time, he also seemed to absorb his environment instead of overtly displaying his behaviors. By the end of the study, he developed a taste for certain songs and books he wanted to hear and actively requested them.

Researcher's Lens: Peeking into the Infant Room

The most frequent behaviors identified through my observations were vocal followed by instrument play. About half of the vocal behaviors were associated with communication and exploration. Instrument play spread evenly between communication and exploration.

Vocalizing with instrument playing during play. With vocal behaviors ranking highest, this seems consistent with what was reported by the teachers. Benny vocalized most of the time throughout my observations, and these sounds accompanied him during his play when he was on the move travelling from one point to another and while holding objects. His sounds varied in range (exploring his upper register while laughing), as well as in articulation and style (slides, lip trills) and even choice of vowels ("ooh, ah, woo," etc.). Benny played various objects, tapping them around the room and testing out

different sounds during his vocalizations. The following episode displays his various vocal sounds while he was on the move and later holding an object.

Episode 37, Researcher Report: Benny makes “uh” descending slides as he walks, then hums descending pitches and makes little screams. Cyndi is at the table and says, “naeh, naeh, naeh” and the student teacher asks her if she wants a snack. They both walk to the fridge for Cyndi to choose her snack. Benny is on the floor, playing with a basket of objects. He continues to stand up with a wooden spoon in his hand, as he makes “nah nah” sounds and makes a hmmm sound in the lower part of his range. GA2 takes him to be changed. He laughs a little but gets a little frustrated too and makes a small shriek sound. GA2 asks for HT1’s help to hold him still. GA2 takes Benny to the crib room to sleep. GA2 says, “nai nai” and Cyndi says, “nai nai” (night night) to Benny twice in a row.

At times, Benny’s movements would shape his vocal sounds, as if the vocal sounds were synchronized with his movements.

Episode 39, Researcher Report: Benny is wandering around and makes sounds using his higher voice and starts shaking his head up and down as he walks away, making, “guh, guh guh” sound in sync with his head movements.

After this point of the observation, Benny started to make siren sounds, which HT2 in that moment pointed out as his well-known, “whale sounds.” Shortly thereafter, he returned to synchronizing his sounds with his movements.

Researcher Report Continued: As Benny approaches the play stove, he starts to play with the knobs and vocalizes in sync with turning the knobs with his hands. He pulls out two wooden spoons, sits on the trampoline and beats out a steady beat with each spoon on the trampoline. He continues to take the spoons across the room as he makes his, “do bee do bee” sounds as he walks, scraping the wall with the spoons.

Benny continued exploring the different sounds the wooden spoons would make around the classroom. In other episodes from my classroom observations, Benny vocalized while holding other infant room objects like toy trucks, music instruments, or household type items like a dustpan and broom set, also matching his vocalizations with his movements while testing sounds on various surfaces, as well as tempo.

Episode 58, Researcher Report: He is holding the dustpan broom and saying, “boo dih boo dih” repeatedly as he shakes it up and down. He is now sweeping the floor in front of him. He is making slow followed by quick and then moderato (tempo) sweeping sounds.

He would join his peers in play during his testing of sounds with objects and his vocalizations. The following episode shows Benny engaging with his peers as they create sounds through their vocalization and by playing the object, in this case, a balance ball.

Episode 55, Researcher Report: Cyndi and Benny are now near HT2 with the large blue yoga/balance ball. They are facing each other and tapping it together with their hands. They then put their mouths on it and continue to make sounds in this way. Frederic joins and rolls the ball away, singing fragments of Twinkle. He continues to roll and make loud, “bah bah bah bah bah” sounds. When he is done, he walks to HT2. Benny now walks to the ball and rolls it and taps it.

Benny and Cyndi’s music making with the ball attracted Frederic, who also started singing while on the move with the ball, before Benny returns to the ball to test out sounds on it. Vocalizations accompanied him most of the time I have observed him in the classroom, carrying vocals with him everywhere he goes, almost as if they are his friends. The tuneful variations in syllables and vowels are plenty and remind me of musical ornaments added to notes, with notes represented as his actions, in this case, sounds that he creates with various objects.

Vocal sounds during routines. I was also able to hear Benny’s various vocalizations while remaining stationary, specifically while he was in the nap room and at the snack table. Without moving from one place to the next, he produced many sounds without objects (in the nap room) and with objects during snack. The following two episodes show his variety of vocal sounds created during nap time and how he brought them into the infant room:

Episode 33, Researcher Report: From the background, Benny is making calls from the crib. It is an elongated sound, hard to hear since he is in the crib, but like

a drawn out, “uh-oooh” which raises in pitch. (...) Benny continues to make the drawn out sounds from the background, intonation slightly raising in pitch at the end. One teacher asks HT2 if Benny’s calls are him crying or him talking to himself. HT2 says it is him talking. HT2 brought Benny out from the crib (...) HT2 changes Benny, he vocalizes lip trills on a descending pitch, then in staccato spurts (Interval is a P5 descending). HT2 asks him if this is his new “whale call” and she lip trills on a pitch back to him.

Episode 38, Researcher Report: Benny is in the background (from the crib), making a high pitched downward slide with his voice. GA2 and HT1 notice the sound, and they both mention his singing voice from the crib room. I now move to the entrance of the infant room, so I can hear Benny’s vocalizations clearly. I hear, “boh boh” staccato, then voiced lip trills ascending and descending, “oooh” as a P5 slide down a couple of times, “owwwma” ascending/descending, voiced lip trills on downward slides and then also beginning at a higher pitch. HT1 goes in and peeks in and gets Ashlee. As she takes her out of the same nap room, Benny starts to cry which turns into a repetitive sound—sounds like his lower voice. He repeats this (does not sound so distressed as it did in the beginning) and then it is quiet.

At the snack table, whether he is alone or with others, Benny made a variety of vocal sounds without objects. During one episode he and HT1 exchanged the phrase, “peek-a-boo”.

Episode 43, Researcher Report: Benny is quiet, eating his banana and snack at the table. Benny covers his eyes, HT1 says, “where’s Benny, where’s Benny?” He removes his hands, HT1 says, “peek-a-boo” and makes a vocal sound. They do this again, and Benny makes a sound like he is saying, “peek-a-boo” but in a bubbly singing voice. Ashlee’s mom enters. Ashlee sees her mom and her face lights up, she smiles, and waves her hands up and down excitedly. Benny makes siren-like sounds, “hoo hoo”; he makes his hand signal for, “all done.”

Benny showcases a wide variety of vocal sounds. Benny will also use objects at the snack table to try out sounds. In one episode, he held a bowl to his mouth, made sucking sounds with it, and sustained, “ah” sounds while his mouth was held against it. At that point, both the student teacher and Benny would make the, “ah” sound before she fed him a spoonful of food. Whether Benny was alone or with others, he continued to generate new vocal sounds. His parents reported, unique sounds at home, like his, “la” sounds in

conversation, and his finger to lips sounds to express his mood. In the classroom, I was able to hear a multitude of sounds in different contexts.

Music Teacher's Lens: Group Music

During group music, movement and instrument play took the lead in behaviors. Functions were related to communication and exploration.

Moving and playing together. In contrast to the teacher and field observation reports, there were very little episodes for vocal behaviors, similarly to Frederic. Benny had the highest number of vocal behaviors during my observations but not during music time. Instead movement and instrument play were behaviors exhibited the most. He often requested the shakers early on in the classes, and he continued to explore various sounds while playing them on different objects in the classroom. While he did move to music, he usually had an object or instrument when doing so. In one episode, Benny brought a canister of objects and shook it while bouncing on the trampoline. At this same time, I stood near him dancing with Lily and Frederic. There was a moment where he saw me swing both Lily and Frederic's arms while dancing, and Benny moves from side to side with his canister. During the first music class of the study, Benny entered into what looked like a breakdance move during the break of the song "Shake it Off." This song was popular in the preschool room since the preschoolers saw the movie *Sing* in the cinema. His sibling, who was at that time a preschooler, enjoyed some of the songs from that movie.

Moving and playing from the periphery. At times, Benny and Frederic were together participating in music from the periphery. What might at first seem like not being engaged with the group turned out to be a surprise when certain behaviors suggest

Benny was involved but in his unique way. In one music class where the group was involved with a bouncing song, babies were sitting in the teachers' laps during the chanting. After some time, Benny went to a baby doll, picked it up, watched the group, and bounced the doll while it was facing him. Another episode involves the group engaging in the "Shake and Stop" song with shakers. Benny was again in the periphery with a shaker in hand, as he tapped away on the stool. He peered at us at times and continued to tap. As the song shifted from shaking to, "tap and stop," Benny watched the group, moved away while shaking the instrument in his hand, before moving further into the back of the room to tap on the uncarpeted area. These subtle behaviors would be easy to miss, but they exist and show his participation with the group, from the periphery, in his own unique way.

Two instances where Benny left the group and moved outside of it were for him to expand upon the current activity.

Episode 68, Researcher Report with Video Timestamp: As I sing "Twinkle," I think Max is singing with me; Devynn is rocking on all fours, then she takes two shakers and taps them together; Frederic raises his shakers, as I do for the contour of the melody. Frederic raises his arms right before I do on the higher note of, "up above." Benny rocks the basket; Ashlee tries to take it from him. Benny makes, "ah" and, "mum" sounds, then picks up his mini toy dog and calls out, "daw, daw, daw," as he shows it to Ashlee and then examines it closely himself. Benny then taps the shakers and carpet with the dog.

11:20 During Tap and Stop: Lily taps, sings, and smiles (meanwhile I hear loud tapping on the side, it is Benny who has taken the shakers over to the basin for tapping!). "Shake up High" is next and Benny raises his arms.

13:50 I sing row your boat, Benny goes to the wooden rocker and starts to rock side to side.

14:18 As Benny rocks the rocker, Frederic climbs in on the other side, they put the shakers in the middle of their "boat."

14:35 Ashlee brings the basket to Max, and tries to put it on his head; someone makes an, “orrr” sound as I sing, “roar.” Max tries to put his face in the basket.

14:50 Benny and Frederic facing me from their boat, tap the shakers on it.

This excerpt shows how Benny participates from the periphery by tapping his shaker in the basin and taking the song further by getting into the rocker, which subsequently attracted Frederic, to rock and tap while I sang. With his peer, they both reenact the Row Your Boat scene, while I sang. Soon after, I sing “Twinkle, Twinkle,” as Lily sang with me and Frederic danced to the song. Benny rocked the rocker once again, which initiated Ashlee to sit in it and to ask for, “ro” (Row Your Boat). Benny made his unique vocal sounds as he walked off.

While he may not appear to be engaged in the traditional sense, Benny had unique ways of bringing in other objects into our musical play. While he made vocal sounds in the classroom and in his nap room, music time was one context where he expanded and added layers onto the musical activities that were taking place. Another episode described an instance where Benny went to sit in the platform and shook his feet as a way to request “Row Your Boat” from me, at the same time sharing the reenactment of the boat scene and taking the song to the next level. This was his norm. I was not yet at the level he wanted, and therefore he showed me. The boat scene attracted Lily who acknowledged and joined in the platform.

Summary of Benny

At home, Benny routinely engages in dance with his family, especially with his sister, who is a musical influence. He often explores sounds through playing objects and instruments and figures out ways of making sounds with his father. With family

members, Benny vocalizes with specific syllables in a call and response fashion, experiencing the nuances of communication. His vocalizations express his current mood depending on the tempo and dynamic of his sounds.

At school, teachers reported that Benny vocalized often in the nap room and at times with another infant. These vocalizations turn into song before they signal to the teachers that they are ready to come out. His vocalizations alone in the crib seem to provide a platform for him to comfort himself and to explore his sounds in the nap room. As these sounds moved into his play, he possibly brought comfort along with him into a different context. In vocalizing, there appears to be an exploratory nature for developing his sound repertoire. As his repertoire of sounds grew, perhaps he was building his communicative toolkit. Benny also engages with his infant peers in music making. He creates new sounds by vocalizing with objects. Listening to songbooks seemed to be related to his desire to be with others, as he joined his peers and teachers; later in the study, through his initiation he communicated his songbook preferences by bringing books to teachers to sing.

During field observations, vocalizations took place with instrument play during his play. He often explored vocal sounds when he is in the nap room or at the snack table. When interacting with his peers, his vocalizing and object playing became a pathway for communication, while possibly exploring the various sounds they are able to create. In music time, he tended to combine movement with instrument play. He communicated with others by participating in music activities both within the group and from the periphery. Benny articulated many different types of vocal sounds. His articulation could communicate his mood or needs and his vast array of vocalizations, using various

combinations of syllables, were heard throughout his vocal range and reflected various tone colors.

V – PORTRAITS OF THREE INFANTS AGES 6 TO 15 MONTHS OLD

Max: The Sound Explorer**Parents' Lens: Musical Max at Home**

Max was 11 months old at the start of the study. His mother is an English speaker and his father speaks English and Hebrew. Max's father enjoys listening to various styles of music from Disney songs and musicals to, "grand music," like soundtrack and epic music. Max's mother has a background in flute performance. Max has his own playlist on Spotify. His parents play music for Max, which includes songs from Disney's *Moana*, Raffi, and some "oldies" like the songs of Jerry Lee Lewis or Johnny Cash. At home, the most prevalent observed musical behaviors were instrument play and movement; these musical behaviors were identified with exploration, communication, and comforting/entertaining.

As I entered their building, a 5-year-old girl who lives in the building was asking Max's mother if she could play with Max. His mother told her that she could play after their guest (I) left. When I entered, Max and his father were playing together. The interview took place in their living room, which contained Max's toys and books in Hebrew and in English. There is a table with a computer from which Max's parents retrieve his playlist. Max has access to a kitchen rack containing pots and pans at the entrance of the kitchen area, located approximately three to four feet away from where I was sitting. We sat around the coffee table; I was on the floor. During my visit, Max made his way around the room by holding onto the coffee table surface and the sofa.

Testing objects for sound repertoire. Max frequently explores objects and their sounds by banging and tapping on them. He is interested in a drum that his cousin gave him and likes to bang on it. He pulls down pots and pans from the kitchen cart and bangs away on them; he taps objects together or on other materials or surfaces at home or outside of the home, for instance in a playhouse at the playground (Episode 21). His mother once noticed during pick-up at school that he was tapping his spoon on a bowl and on the table during his snack time (Episode 18). Later at home, he continued his spoon tapping on a bowl before holding the bowl to his face and vocalizing inside of it, creating an echo of his, “ah” sounds. He continued walking around the apartment tapping and scraping on objects. His parents reported Max doing this with other household objects made of a variety of materials and surfaces (Episode 23). Because of his exploration of materials, he discovers new ways of playing objects, producing sounds, and creating instruments. One parent diary entry described Max finding two coffee capsules (single serving portions encased in plastic) on the floor; he, “started to shake them like maracas!” The video clip his parents sent along with the entry showed Max sitting upright holding a coffee capsule in each hand, shaking them with both arms raised. In another diary entry, his mother reports Max combining objects together to create a new sound, as well as a new instrument:

Episode 19, Parent Diary, 7 a.m: When Max woke up, he continued his musical explorations with his favorite accessory, the spoon. Max bent over his small bookshelf and tapped the spoon on the back of the shelf. He tapped the spoon on some books (before offering the spoon to the cat, who declined to accept it). Max even inserted the spoon into one of his Lego blocks and shook the spoon back and forth – a shaker and a party toy! – before the Lego went flying away.

Throughout his expedition in seeking out sounds, Max seems to try out various sound combinations, and in the process, discovers ways to turn nonmusical objects into musical ones. These diary entries seem to show his parents perceiving Max's exploration of sounds and objects as inventing new kinds of shaker instruments in the process. Everyday items like coffee capsules are now showcased as an instrument for music making.

Discovering and moving to sounds. Max responds to music by moving to it, whether it comes from a specific sound source (person, speakers, smartphone, musical toy, mechanical toy, ice cream truck) or from his own created sounds. He enjoys going with his parents to a local restaurant that features live jazz. His parents reported that Max has a special smile when he enjoys a familiar song. One example where he shows his special smile is during an Israeli clapping song that his father sings and claps to with Max. His parents also reported that Max was interested in the source of sound. If music starts to play, he will stop and seek out where the music is coming from (often the smartphone). His father reported in one entry that Max danced even when there was no music playing on the phone. It is as if the mere thought of music coming from the phone plays like a song in his head; or he might have been requesting it by engaging in movement behavior.

Max dances to his own initiation of playing music from an object. His mother describes how he tries to get the police car to play music:

Episode 17, Parent Diary, 7 a.m: Max was playing in the living room with Mom and Dad. He found his small police car, which plays music and talks when turned on. He picked up the police car and began to shake it. When he pressed the button to hear the song, he started to dance happily.

In this case, he presses the button and the police car provides music so he can dance. In his own exploration of sound, Max responds to his own self-created “instrumental” sounds. The following diary entry from his mother describes his movement response to the sounds of Lego blocks:

Episode 12, Parent Diary: Max and Mom were playing in the living room. Mom gave him a big bag of oversized Lego blocks and unzipped the bag. Max began to shake the Legos out of the bag. He appeared to be very excited by the sound and started kicking the bag. The more the bag rustled, the harder Max shook and kicked. Max hasn't seen these blocks in a while, so it was cool to see him interacting with them.

His mother sent along a photo and video with this entry. I could hear that when Max knocks around a few blocks with his legs, it makes a rich, dark sound. Something propels him to move his feet and arms faster while holding the bag, creating higher pitched rattling sounds from the blocks in the bag and on the floor hitting each other. Playing with the Lego blocks, he created sounds with various timbres and responded to them by making his motions faster. It seemed like he was part of a large shaker instrument, with a rich timbre. Max also danced to his self-created sounds of a household item, folding chairs. His mother reported that he found some folding chairs between a chair and a wall. As he banged them back and forth, he seemed to enjoy the sound. He danced and moved, “his body in the bouncing way he often does when music he likes comes on.”

Movement and gesture as request. By initiating a movement or gesture behavior, Max was able to let his parents know his musical preferences. Max and his father clap together during the Israeli clapping song. In one episode, his father recognized the song in Max's behaviors.

Episode 15, Parent Diary, 3 p.m: Max was sitting on the floor in the living room while Dad watched him from the couch. Max started jumping up and down and clapping his hands together while smiling. Dad started to sing the Israeli song

“Capim Capim” (we’re guessing about the English spelling--it means “Clap Clap Clap”) and Max clapped his hands even more! It seemed like Max was singing a song to himself, because we weren’t playing music--but he started dancing and clapping on his own!

At first when I read this episode, I interpreted that perhaps Max was singing the song. However, the entry states that he danced and clapped. If Max was not singing, his father recognized the movements and claps during this song. As his father starts singing the song, Max’s faster hand clapping seems to indicate that he was fervently participating in this duet, and that his father interpreted his movements correctly.

At bedtime, Max and his mother sing together; his mother reported that playing songs and singing calms him. Max also makes requests at bedtime. In one diary entry, Max’s mother began by singing “Wheels on the Bus” when Max lifted and wiggled his finger. This gesture cued his mother to sing the song. His parents often play this song for Max or sing it. Here, Max engaged in the movement behaviors as his mother sang. The lyrics of the song include the phrases, “one little finger” and, “tap, tap, tap,” instructing motions like pointing the finger up and down and to various body parts. In this scene, he continued to wiggle his finger, shake his hand on the tap part, and he touched his head. While his mother’s comments stated that she was uncertain whether his finger gesture means he wants to her to continue singing or that he is requesting that song, it seems to be a request or acknowledgement.

Max enjoys listening to songs that his parents play. His mother reported another way that he asks for songs, by hopping. This, apparently, was a new move for him:

Episode 27, Parent Diary: Max has another new way of asking for music. As he and Mom were playing in the living room, he approached Mom and started hopping from one foot to the other, dancing. Mom asked if Max would like some music, and then put on some songs from Moana. Max followed and smiled when the music came on (while continuing to dance).

From this scene, it seems that Max was trying out new ways of requesting music, which depended on his level of physical development. His parents' excitement and immediate response to his musical cues indicated they are in tune with his musical requests when Max signaled pleasure in the music making.

Teachers' Lens: Musical Max at School

At school, behaviors spread somewhat evenly throughout with listening as the most prevalent observed perceived behavior, followed by vocal and instrument as evenly reported, and then by movement. Many of the behaviors' functions were unidentified due to not having enough contextual information from the data. Comforting/entertaining self and communication were functions that were most observed.

Listening diminishes distress. At home, Max's parents discovered he responded well to music as it helped to calm him down. At school, HT2 began working in the infant room at the same time that Max began attending. Both were new to the infant room, and she felt they had a connection for this reason. HT2 reported that Max's parents had informed her of the types of music that he likes:

They were saying that for some reason he liked the 50s and 60s blues music, or like "Rock Around the Clock" kind of stuff. I see women in poodle skirts and guys with hair slicked back kind of music. Like "Happy Days" music. We were just trying to figure him out and that's what something his mom said that they figured out that he would calm down to, so we put it on. Especially at diaper changing when he was not having it, we put it on and he would stop to listen to it. (HT2)

HT2 previously worked in the toddler room, and the infant room was new to her when she began in the summer before the study began. By the time of the study, she had had the fall term to adjust. HT2, who also had a toddler son at the time, has a good

relationship with Max's mother; they have visited with each other outside of school. Another time that HT2 used music was to make transitions smoother for Max. As transitions were not easy for Max, she sang for him as he was being placed in the group cart or in a stroller. It is unknown whether singing continued when Max was being pushed in the cart or stroller; however, singing was used while he was being moved from one point to another.

Since the summer they both started, Max had a difficult time transitioning to the crib. At the time of the interview, HT2 still sang to Max in the nap room:

And I still sing to him because often we walk into the nap room, and he gets upset. And so, before I put him down in the crib I sing a couple of songs to him, actually I sing the songs I sing to [my son] at bed time. I'm like, am I cheating on [my son]? Maybe I'll switch the order of it. I feel like it calms him down because then he cradles into my shoulder and then he feels less tense. He's a very tense kid. I still sing with him and I feel like he goes down happy so there's not as much crying. [He] and I have a very special connection. (HT2)

Singing to him at nap time seemed to stop his crying. This episode depicts a sense of intimacy between HT2 and Max. She mentions her son since she is using the same songs, and the, "cheating" reference perhaps relates to the songs and the intimate nature of holding him and feeling Max's body eventually relax; she remains with him until his stress is gone.

Shakers and spoons. Teachers reported that tapping objects and playing shakers were prevalent with Max and the younger infant group (Ashlee and Devynn). HT1 reported during the second interview that as Max was walking then, and along with shakers, he preferred to hold objects in his hand while he walked. This included shakers, his snack spoon, or the wooden spoon in the classroom. This was consistent with the home reporting of Max walking around his home with a spoon as he tapped on surfaces.

HT2 reported that he seems to always be shaking something and that, “he seems to respond to the noise like he’s shaking harder and he’s like ‘yeah.’” This response is similar to the home report of Max making sounds by moving his legs against the Lego blocks, which in turn made him kick faster and more intensely. The way HT2 depicted how he shook, “harder” seemed to capture the same intensity as the home report. He seemed to be in solitary play in these instances and was focused on his own sound-making.

HT2 talks about how songs from music time creep into infant room play.

That one- Oh, then you shake and you shake and you stop. That one I feel, especially because intentionally or not some of your shakers were left behind. I think that kind of was like, “maybe it was part of your study,” because I think that kind of had them remember it and like, “Max, shake” and you’d see him shake and then stop. Then I’d start singing that. (HT2)

While it would be an interesting idea to leave shakers behind intentionally for babies to conjure up music time songs into their play, I did not do that for this study. Nevertheless, it would seem to be an effective strategy, as Max in this scene initiated this musical play, and HT2 responded by singing a variation of the “Shake and Stop” song. The presence and reminder of the shaker initiated the musical play between the them.

Conversations through musical vocalizations. Max has some sounds in his vocal repertoire. At home his parents described a bird-like sound he makes in a soft voice using, “bah.” At school, teachers reported a few types of sounds they hear Max vocalize. GA1 describes how she will imitate back what she hears from infants and very often they will do it back.

I do a game with Max. This is something that I’ve been doing the last few weeks. Max will say, “Bah, bah.” Then I’ll look at him and I’ll say, “bah, bah.” He’ll do it back. We might go back and forth like that for a few minutes. If I say, “bah, bah, bah.” He’ll imitate me and do it three times. Like he gets it. So, that’s

something that I hadn't thought of. Yeah. With Max, he's very good at it too. He'll continue for a while. (GA1)

When I asked GA1 why she chose to respond to his vocalizations, she answered that it allows them to connect. He seems to really enjoy it and it, "allows him to feel like he can communicate with me and that I am understanding him." The statement that, "he gets it" indicates that they are both in tune with one another, as they go back and forth musically in a call and response as they experience the various tones and lengths of the phrases. Other vocalizations that teachers reported were guttural sounds during diaper changes, and a type of laugh that Max makes. GA1 hears this laugh when he enjoys something, but when his laugh does not fit the situation, she thought Max was "experimenting with his vocal cords." At the end of the study, HT2 mentioned that the teachers were still trying to understand the meaning behind this laugh.

Moving and connecting to sound sources. Max bounces to music played through speakers, to singing/chanting from others. One episode describes Max's seeking out the sound source of the music before bouncing to it. The dance space is a windowed room located in another building near the childcare center. It is a room with wooden floors, wall to wall mirrors, a stereo system, and other play items. Often, teachers at the childcare center will take the children there when the weather outside is not suitable. It provides a large floor space for children to move around. GA2 recalls how Max sought out music that was playing in the dance space.

GA2: Max crawled all the way to my cellphone which was the one playing the music and took my cellphone and started moving to the rhythm of the music.

Nita: Like bouncing? Is that what he was doing?

GA2: Like bouncing. ... He was sitting and holding the phone and bouncing himself. Even when I took my cellphone from him, he continued bouncing himself.

This episode is similar to a few episodes at home where Max upon hearing music, seeks out the source and wishes to hold, shake the object (phone), and move to it. He seems to know that the smartphone plays music. In the dance space, he either crawled towards the speakers where sound was coming from to find the phone or knew to look for something resembling a phone. By taking hold of it, it is as if he captured the music and is proudly dancing to it with it.

Max also responds to other children chanting. When the weather is nice, infants take a stroll (by cart) to a park near the center. Upon hearing other children in the park chanting, Max looked at them and performed the same bouncing movement. Even to others outside of the infant room, he seems to respond to music he hears. In the infant room, Max will join his peers in musical activity. Lily brought HT2 the book *The Lady with the Alligator Purse*. Once HT2 started singing, Max joined:

Episode 44, Teacher Diary: HT2 positioned the book so Devynn could see the book. HT2 started singing and soon Frederic and Max joined. Max started to babble as HT2 sang the song. Devynn rolled and got closer to the book trying to grab the pages. When HT2 read the part where Tiny Tim tried to swallow the tube, she touched Frederic and Max's throat. This made them giggle. Frederic signed "more" for HT2 to keep reading. When HT2 finished reading the book Devynn rolled over and started to make her raspberry sounds. Lily asked for the book again and Devynn rolled back over closer to the book. Frederic touched his throat when we got to the part Tiny Tim swallowed the tube. Max bounced a little as he was holding onto [HT2's] shoulders.

This scene, initiated by an infant, depicts not only the child-centered curriculum of granting a child's music request, it also shows how the act of starting the musical process attracts others to join and remain within the musical space. Max, in sync with HT2,

babbled along with her. Max and Frederic joined at the same time and the shared giggle during the Tiny Tim part invited them to actively engage in the listening, later leading Max to bounce to the music of the songbook with the group. In each episode where Max bounces to music, he is attracted to the sound, seeks it out, and remains and responds within it.

Researcher's Lens: Peeking into the Infant Room

At school, vocal behaviors were the most frequently noted, followed by movement behaviors. While several episodes were coded with undetermined functions, exploration and comforting/entertaining self were the prevalent observable functions.

Vocalizing and moving with objects. Max vocalizes an array of sounds, often when he moves his body and while holding objects in his hands. Sounds include humming, repeated syllables like, “gae,” “buh,” “bah,” a flutter-like sound similar to laughing, glissandi, and growling-like sounds, among others. The following episodes show some of Max’s various sounds, as he moves within the infant room.

Episode 48, Researcher Report: HT1 washes Max’s hands at the sink and puts him down in the art area (with multi colored tape). He makes long hums, as he crawls towards the table. HT2 is sweeping up the food he dropped. He holds onto a hand-held broom and sits under the table and vocalizes, “gae gae gae” continuously as he sits there. A teacher takes Devynn to the table to eat solids. Max stands himself up using the stool, looks at Devynn, bounces and vocalizes as he looks at her. Devynn is anticipating her food, makes vocal sounds of complaints as the teacher heats up her turnips. (...)

2:06pm Max is on his knees and bounces up and down, making vocal sounds that sync with it (or a continuous vocal sound and the bouncing interrupts it). Max is pulling colored tape from the board. He makes what sounds like growling sounds a few times.

Max makes his way to the play kitchen, takes the wooden spoon, and hits the stove top. While standing up he bounces and makes vocal sounds “ayyy, ayyy.”

Devynn watches him. Max makes these flutter sounds (similar to laughter) with his voice, now with two wooden spoons, one in each hand, as he taps the book shelf. He gets on his knees, spoons pressed on the shelf, bounces on his knees, makes a few vocal sounds.

The wooden spoons, as reported by his teachers and parents, usually accompany him around the infant room, as he taps on various objects. Throughout this scene, Max vocalizes various types of sounds and a few of those times he is crawling and bouncing. When he is in one place focused on the colored tape, I heard him make another type of sound, growling. In other episodes, I have observed him on the floor in crawl position rocking back and forth while making soft vocal sounds. In this particular episode (54), he had an, “orange spoon, waving it with one hand and vocalizes ‘ah’ as he twists his body side to side, which includes shaking his head left to right.” Here he is incorporating vocal and movement behaviors with object in hand.

When coming across a new object, Max studies it before vocalizing with it. In another scene, HT2 gives Max a castanet. He holds it and tries to figure out how to play it:

Episode 66, Researcher Report: HT2 brings an orange castanet to Max; she clacks it. He reaches out for it, and it falls. HT2 continues cleaning, and he picks it up from the carpet. He walks towards the book case and slowly looks at it as he holds the castanet in one hand. He opens and closes the castanet with one hand making a soft clacking sound. He walks away with it and continues to clack it with one hand. (...) Moments later, I hear, “da da da” continuously in a sing song voice. I see Max walking, still holding the castanet and vocalizing softly, “da da da.” It is almost as if he is singing and playing to accompany the background of children’s songs.

Max took time to work out how to play the castanet as he saw HT2 do it. Once he figured it out, he seemed to continue walking around the room playing it and adding his vocalizations to the open/shut movement of the castanet. He plays it softly and his vocals matched the dynamic of his playing.

There are a few popular objects in the classroom that seemed to attract musical behaviors from Max. During one observation (episode 49), Max was on his knees inside the rocker, making vocal sounds as he moves. The following episode describes Max moving around the room with a basket:

Episode 57, Researcher Report: Max crawls over to the display board. He crawls away from the area and back, and makes sustained “ah” sounds, as he crawls, which gives the sound a pulse. Max is now pushing a basket. He is on his knees and makes a louder “ah” sound, as he moves with the basket. There is yet another basket turned upside down. He pushes it towards the bulletin board of photos, making, “baaa baaa” sounds. He pulls a piece of black tape off of the display.

In this scene, Max first vocalizes on a long tone which the crawling provides as a natural pulse. As he pushes the basket, the dynamic changes to a louder sound, before making a different sound with a new basket. The intensity of sound in the following episode seems to be propelled by his movement and intent. The following episode shows Max ready to take off on his crawling:

Episode 51, Researcher Report: As GA2 sings “If You’re Happy and You Know It” during Ashlee’s changing, Max is in front of me in crawl position, rocking back and forth and making sustained, “ah” sounds for some time while rocking. Suddenly, he makes a loud exclamation of, “ah” as he crawls away, like propelling himself forward with force.

The intensity in the sound seemed to cue the listener, me, when he was about to change his movement.

The trampoline is another piece in the infant room where Max will move and vocalize while on it. In episode 45, Max made vocal sounds and bounced, while seated on the trampoline. He started with, “ah” and when he stood himself up on the trampoline, the sounds changed to, “a wah, a wah.” There seems to be a variety of sounds that accompany movement. The various sounds seem to be the result of Max working out new

sounds from his vocal repertoire, as he accompanies himself musically, as if his movements are melodies with different shapes and contours that define the dynamic of sound. This melodic accompaniment's role could also be one of friendship, being by his side as he works in the classroom.

Music behaviors at the table. Max vocalizes while at the snack table, whether he is alone or responding to others. Bowls, containers, cups, and eating utensils can be a musical sound source for all types of music making. In one episode, Max is holding a pink spoon and feeding himself. At one point he holds the container of his apple sauce to his mouth and softly vocalizes on, "ah." Meanwhile, Devynn is in the room making various sounds, and Ashlee is crying. They do not seem to disturb him as he continues to explore sounds:

Episode 47, Researcher Report: Max is making soft, "ah" sounds (sounds lower in his register). Devynn has rolled towards me, she is on her back and continues to make voiced gurgle sounds, holding her hand to her mouth. Max is making continuous "ah" sounds on some elongated tones; it sounds like he is singing. Max taps the spoon and container while making his repeated vocal sounds on, "ah," while he holds the container to his mouth.

Max explores his range and articulation during these spontaneous vocalizations, before they become longer and turn into what sounds like spontaneous song fragments. He plays the container with the spoon, as if accompanying the vocals. However, it seems as if the bowl provides an acoustical feedback for Max to hear his voice in different ranges, note values, pitches, along with the percussive sound of the tapping.

During certain times of my observations, Max and Ashlee would be the only infants who were awake. While at times they seemed to engage in parallel play, there were times when they directly interacted with each other. In the previous scene, Max was

sitting alone at the table when making his vocal sounds against the bowl. In the following episode, he is seated next to Ashlee at the table, as they both wait for their snack:

Episode 58, Researcher Report: Ashlee and Max look at each other. She reaches her hand out to him and makes a few vocal sounds. Max sits quietly watching Ashlee as she makes sounds while making chewing motions /a jai jai ja ja ja/. She does this three times (she is chewing on crackers). She reaches her hand out and vocalizes on a louder, “ahhhh!” She waves her arms and starts to make louder cries. Max has cheese and meat in front of him and knocks it on the floor by accident. Ashlee takes her hand and covers and uncovers her mouth repeatedly while vocalizing, creating a vocal effect. As Ashlee sees food is on its way, she starts to smile and laugh. Max has a stainless-steel bowl in his hand and covers his mouth with it, making a similar sound effect that Ashlee made.

It is interesting to see how Ashlee looks at Max while vocalizing. Max on the other hand appeared to only be observing Ashlee. When he starts to make vocal sounds with the bowl, it was unexpected for me to hear a sound similar to the one Ashlee made because it happened after she made it, sounding like a musical call and response. While it seems natural that vocalizing with a bowl might encourage the child to move the bowl to test out various sound effects, I have heard the infants vocalize by holding the bowl on several occasions.

In the following excerpt, Max, Frederic, and Ashlee are at the table with HT1 and two other practicum students. Frederic begins clapping with a student teacher, as he does this, he points to Max, who is sitting next to him. Frederic finished with his snack and is ready to leave the table:

Episode 61, Researcher Report: Frederic says, “a dah” (all done) to the practicum student, then vocalizes, “ahh buh buh” which turns into elongated vowels, like he is singing. Max is patting his hands on the table, making vocal sounds as he bounces in his seat. After washing his hands, Frederic walks back to Max and touches him. Max reacts making vocal sounds and bounces with his arms waving.

During this part of the observation, it was unclear to me why Frederic pointed to Max before leaving the table. He returned to Max, whose immediate response was to move and vocalize. Frederic is an infant who sings often in the infant room. At the table, Frederic's vocalizations seemed to encourage Max to respond by vocalizing to him, as he moved his body and tapped the table. It was difficult to tell here which of his behaviors might have been the main one; because Frederic was singing, Max could have been singing back, accompanied by the other behaviors. I have described Max's musical behaviors as elongated tones that sound like singing, or as bouncing movements that accompany his vocalizations. His musical behaviors are not as recognizable as some of the other infants. However, Frederic is one who sings songs often. He began with syllables before moving to elongated sounds, which then turned into singing. This is very similar to Max's process when beginning with syllables. This scene seems to describe a musical interaction between Frederic and Max. The table could be a place where Max snacks and develops his musical repertoire of sounds. At the snack table, whether alone or with his peers, he continues to explore sounds with objects and interact for example in call and response. The various resources in the room, whether a bowl, spoon, rocker, trampoline, other sound makers, or the table, provides the sounding board for Max to explore and create new sounds to add to his vocal repertoire.

The Music Teacher's Lens: Group Music

During music time, Max exhibited a high number of movement behaviors. The most prevalent function was for communication.

Participating within the group. While Max's most prevalently observed behavior during music time are movement behaviors, he engaged in other musical

behaviors within the group. On several occasions, Max would stand near the shakers during the opening movement/dance segment and indicate his preference for the shakers by reaching for them. He explores the shakers, as the others do, when I bring them to our group. In many activities, he bounces while on his knees, as we sing various songs. During the bouncing song, “This is the Way the Ladies Ride,” the song ends with me singing the melody from the *William Tell Overture* theme. He often bounces when I sing the *William Tell Overture* theme, and in another episode (78) he vocalized while bouncing. In the next moment, his movements became more adamant and his vocals reflected the movement as he began to sing louder. In episode 76, Max twists from side-to-side while making, “bah bah” sounds, similarly to how I sing the overture theme using, “da da dum” syllables. In these instances, he shows more musical behaviors while making music within the music group setting.

Max interacts one-on-one with others as well. Often when I enter the infant room, Max sits at the snack table with HT2. As I start the music, I dance with other infants and approach Max and dance near him at the table, as we make eye contact and sometimes physical contact:

Episode 82, Researcher Report: “It Don’t Mean a Thing” is playing. Max is sitting at the table. He smiles at me as I dance with him. I put away the shakers further back on the counter as I am reminded of how Benny can reach them. A practicum student is moving to the music as she sits and holds Lily. Max is now being changed, and as I interact with him at the changing table, he smiles at me. (...) As soon as Max is done changing, he holds his arms out to me (HT2 takes the video camera from me). Max, Ashlee, and Lily dance (with teachers).

With Max’s responsive smiles, I continue to interact with him during his changing. When he invites me to dance with him, he is adamant in his invitation to dance. In another episode, I asked Max if he wanted to dance and he walked towards me reaching his arms

out to me in the same strong way. HT2 suggested we play the song “All about that bass,” as it seemed to be a well-liked song by Max. She plays the song and I start dancing with Max:

Episode 85, Researcher Report: As the music begins, I dance in front of Max who walks to me with arms raised up (...) After dancing for some time, I put Max down, he follows me and I pick him up again. (...) When the song ends, Lily says “more.” Max and Ashlee both reach their arms out, to dance again? Or perhaps to see what instrument I will bring over? Max cries and HT2 takes him for his nap.

In this scene, Max clearly wants me to dance with him by holding him during the song. All the infants during this time seemed to enjoy dancing as their arms were raised up in the air with hand gestures and legs kicking to the music while being carried and subsequently requested for, “more.” It was a scene that brings both laughter and tears, as it is amazing how these young people express themselves to this song within the group, making music with their peers and their teachers.

During her interview, HT2 mentioned a special type of connection that she has with Max since they both started in the infant room together. Usually upon entering the infant room, they are together at the snack table while the others are on the floor/carpet. At the table, HT2 will move to the music playing while feeding Max, and he responds with movements as well. When music time starts on the carpet, he is able to peer down at times to see what is happening as he is eating; he interjects sounds while we are doing music, which may or may not be related to our activity. When Max finishes his snack, he and HT2 join the group for music. Even with the group, HT2 encourages and supports Max’s music making as they engage in the music activities. In this episode, infants are exploring the shakers:

Episode 77, Researcher Report with Video Timestamp:

17:40 During shaker exploration, Max is sitting in the circle near HT2. Max looks at HT2 as he taps the shakers, HT2 sees this and imitates him, but he loses balance and falls over. He also looks over to GA1, turns around and is facing in the direction of HT2.

18:04 GA1 starts to tap her shakers. Max twists side to side. **18:25** Max crawls to HT2, claps his hands, and she responds by tapping the shakers together (like clapping), then he reaches both hands to her and she picks him up and he sits on her lap. He then claps and shakes his hands. Various shaker sounds are happening around him, he is facing out to the group. HT2 watches him as he waves his arms, she has a shaker in her hand which he takes. I begin singing “Shake and Stop.” He looks at me and plays his instrument and smiles. Devynn is sitting in front of them playing her shakers while she is facing Max.

19:15 During “shake up high,” Frederic’s arms go up, then Cyndi, then Lily, back to Frederic again.

19:55 During this high/low segment, Frederic gestures physically to the cues. Max is watching. **20:10** Frederic stops on cue. During the pause, I continue singing when Max plays his shaker.

20:20 I tap Lily’s shakers, she smiles and gently taps back.

21:00 Cyndi shakes her instrument faster to match the faster tempo. I sing the Apple Tree song; during “Shook the tree as hard as I could,” HT2 shakes and massages Max’s shoulders. He has big smile while holding shakers.

22:08 During the next time I sing “Shook the tree as hard as I could,” HT2 shakes Max’s body. He has a big smile, while looking at the group.

Throughout this scene, Max watched and focused on the activities. While he responded to GA1’s playing, he eventually returned to HT2 to continue his music making. He participated from her lap, and she supported him in other ways (other than his shaker playing) so that he could feel and embody the music around him. By bouncing, massaging, shaking him, he stayed connected with the group even with this one-on-one attention. It is as if he gained a sense of safety with HT2 while being with the group.

In my field observations, I have observed Max and Ashlee during infant room play many times, especially when they are the only two awake. The space is shared between them. During another music class (episode 80), Max is sitting in front of HT2 with shakers. He and Ashlee are sitting and facing each other. After I finish singing the end of the “Shake and Stop” song, and as I bring out the scarf for the scarf song, Max is playing his shakers while facing Ashlee. As Lily volunteers to go under the scarf, Ashlee begins vocalizing a few pitches that sound like a song while shaking, which actually sounds like the pitches and intervals of the scarf song. I actually start singing using her starting pitch (not intentionally). Ashlee has a turn at the scarf and Max watches as she unveils herself. During her second turn, Max unveils her in a very strong swiping motion. During this scene, and before it, Max and Ashlee interact with the shakers. Max is again near HT2 while participating in the group and with Ashlee.

Participating from the periphery. Max participated in music even though he did not directly join the group at times. When he is eating at the table during the opening music segment, he responds to me and to HT2’s response to music. The song “Shake it Off” was a popular song in the preschool room that term since the preschoolers went to see the movie *Sing*. I played this song on occasion since Benny’s sibling was at that time a preschooler:

Episode 68, Researcher Report with Video Timestamp: Max is eating and seated next to HT2 (6:55), she sings part of the song to Max and she moves her upper body to the music. Lily is being held by GA1 as they dance, and Benny is at the play kitchen area. (7:06) Max starts to bounce in his chair during the break of the music with HT2 while continuing to eat. Lily and Devynn dance together while GA1 and I hold them (7:35).

A few minutes before this episode started, Max was bouncing in his seat and HT2 bounced in response. When I noticed it again after the music break, I danced towards him

with Devynn in my arms as he observed us. On another day while playing “Conga,” Max again at the table with HT2, watches us dance, and he moves side to side in his seat, vocalizing, “ba ba” with a bottle in his hands. Music was playing, and he was looking at the group dancing when these movements and vocalizations occurred. During the bouncing song of one class (episode 81), HT2 took Max to the side while he drank his bottle. He was able to see the group clearly from his position in the classroom. When we sang “This is the way the ladies ride” Max vocalized during the pause before the *William Tell Overture* theme both times in this episode and raised his legs and kicked his feet during the second time. HT2 had been bouncing him while he was on her lap. There were so many subtle behaviors in this scene from infants, Cyndi leading direction of movement with her movements, Benny, also in the periphery, joined in by bouncing a doll, and Lily raising her legs during the pause to prepare riding. Even outside of the group, Max actively participated from the periphery, in these instances with HT2 nearby. In the bouncing song, it also seems as if he was contributing to and leading the song.

Leading the group. The following episodes describe Max participating in the group and performing the next musical idea by starting it himself. In episode 76, Max is in the middle of the circle bouncing and vocalizing while we are singing the bouncing song. He moves towards HT2, continues to move to the music before getting in crawl position, rocking. During the “front and back” lyrics, it almost seems as if he is rocking forwards and backwards. When Frederic gets the mirror for the hello song, Max watches him, moves further into the circle and bounces right before we start singing. As we sing to Frederic, Max twists from side to side and smiles before crawling to another direction. In this scene Max observes Frederic with mirror in hand, and it seems that he knew

singing was about to happen. He then moved to a new spot in the circle and anticipated the song with his movements.

In episode 78, during a bouncing song, Max deliberately moved his body to one direction before the rhyme, again what seemed like anticipation and leading the direction. On the next time around, when falling to the side he vocalizes on, “ah.” As we continue the bouncing songs, he continues to bounce more adamantly while smiling. His bouncing accompanied by vocal sounds grew louder at one point. It seemed as if the more he participated and contributed, the more intense his behaviors became. During the hello song of another episode (79), after Ashlee had her turn, Max approaches her for the mirror, gesturing and vocalizing. However, he does not take the mirror, as he returns to HT2 a few times instead. When the fieldwork student asked Ashlee whose turn was next, Ashlee walked towards Max with the mirror. It seems that Max’s vocalization and gestures to take a turn, and adults asking if Max wanted a turn, Ashlee recognized that logically he would be next. As she does spend time with Max in the infant room, she might naturally have wanted to offer her peer a turn, as a way to interact with him. Max already starts singing with the mirror in hand and he begins his vocals on the same starting pitch that we began with Ashlee. This vocalization happened before we started singing, and we matched his pitch; he seemed to remember the pitch and led us into the activity, while he also anticipated the musical cue by looking into the mirror. As we continue to sing, he sways and looks into the mirror. Moments later, during Cyndi’s turn, we take a slight pause for breath before the beginning pitch of the last phrase; Max again sings the starting pitch (a different note) before we do, leading us into the final phrase.

Summary of Max

At home, Max engages in instrument play frequently. He is interested in the various sounds and timbres objects make when he moves around his home. In exploring these sounds, Max discovers new ways of making sounds by playing objects together, and he also turns nonmusical objects into musical ones. In his search for sounds, he finds ways of putting objects together, creating new musical instruments. When Max discovers new sounds from objects or toys, he also responds musically by moving and dancing to the sounds he created. Max also enjoys moving and gesturing to music and song with his parents. During active music making with his parents, he exhibits his special smile of enjoyment, as he communicates musically with his parents by clapping, moving, and singing with them. At times, song can also calm and comfort him. He also explores new ways of communicating to his parents his musical requests. By engaging in song with movements, gesturing by clapping or wiggling his finger, and moving his body in new ways possible for him, Max communicates his requests, and his parents follow his cue, and participate in the music making with him.

At school, teachers reported that Max was distressed at times, for example, during diaper changes and transitions. During these moments, when music was used, he stopped crying. He seemed to be comforted during changes, and it also seemed to calm him when music accompanied motor activity. During his naps, the intimate nature combined with song provides calm for Max's body as he drifts to sleep. Objects like shakers and spoons are also popular with Max, as he prefers to hold one while he walks around the room and play them. Hearing his own created sounds seems to provide some sort of feedback that propels him to perform the action with more intensity. Having discovered an instrument

left behind from music time, Max remembers the song which leads to engaging in music making and communicating with others. Max vocalizes a variety of sounds, one of which engages him in a musical conversation with his teacher, allowing them to communicate and connect as if they understand one another through call and response. Max moves to music he hears. Sources can include speakers, in which case, he will seek out the sound source, from other children's musical vocalizations, and within the infant room community through songbooks. Max connects with the sources of music, responding and communicating with those in the musical space.

During field observations, Max has a variety of sounds and syllables that he explores, while varying the range, dynamic, and articulation. His vocal sounds that accompany seem to also provide a sense of comfort as he comes up with new sounds when in play or even at the snack table. As Max moves and vocalizes together often, his vocalizations appear to accompany his motor activity, for instance, bouncing or crawling. The intensity and speed of the vocal activity at times determines the dynamic of his sound. Max will also have an object in hand, like a spoon, or be seated in an object, like the trampoline or rocker, in order to move while vocalizing or tapping/playing.

During music time, Max engaged within the group in music making exhibiting vocal, instrumental play, and movement behaviors, with the latter being the most observed. He interacts musically with the group with HT2 nearby where he will return to her even after being in the group. While communicating with the group within the various music activities taking place, he also seems to seek safety and comfort by returning to HT2, where he will also communicate with others musically. He interacts with other infants and has been observed several times in the infant room with Ashlee

alone; in music Ashlee and Max also work together musically. There are instances where Max will interact with the group from a distance, for example while eating or having his bottle. Still being able to see and hear the group, he contributes musical ideas and connects with the group in this way. Max engages in musical behaviors in order to start the activity or song before the group joins. He seems to be anticipating the next musical idea, and in doing so is communicating to the group and leading them by exhibiting what comes next in the music.

Ashlee: The Musical Social Butterfly

Parents' Lens: Musical Ashlee at Home

Ashlee was 11 months old at the start of the study. Her mother, who had previously worked in the infant room at the same childcare center, began working in the toddler room the same year that Ashlee entered the infant room. As an infant room head teacher, her mother was familiar with musical activities that took place during infant music time since I had worked with her in the infant room prior to the study. Both parents are English speakers. Ashlee's father loves listening to various types of music and according to his wife, knows all the songs that play on the radio, the related albums, and details of the songs. Ashlee's mother, who originally was a music major in college before entering the childhood education world, reads music, plays the flute, sings, and plays the piano. Both parents actively make music with Ashlee, dancing with her, singing with her, and encouraging her interest in the keyboard at home. In the home environment, the most frequently identified behaviors were movement, listening, and instrument play. The most frequent perceived functions were communication, comfort, and exploration. Movement

behaviors were mostly identified with communication, listening was associated with comfort, and instrument play for exploration and communication.

The interview took place in Ashlee's room/play space (originally her parents' room), containing her toys, musical toys, and a stereo system with turntable included. Paul McCartney was playing in the background at the start of the interview. Music continued to play throughout the interview, and Ashlee had the freedom to move about the space and interact with us.

Creating at the keyboard. The keyboard at home plays a role in Ashlee's music making. Her mother plays the keyboard often, which is located in the living room. She plays songs on it with Ashlee nearby, although she reports that at times, Ashlee would try to eat the sheet music. Ashlee often goes to the keyboard to press various keys, as well as to dance to any pre-recorded beats/music that plays. When the keyboard was turned off, Ashlee would press various keys, and her mother would encourage her music making by asking her if she would like to play, before turning it on. When she presses the keys and creates sounds, she becomes pleased. Ashlee, who moves and dances quite a bit at home, responds to the keyboard's prerecorded beats after she has pushed the appropriate button. Once she hears the music playing, she generally responds by clapping or waving her arms and dancing to it:

Episode 19, Parent Diary:

[Mom] and Ashlee were in the living room at home.

Ashlee approached the keyboard on the floor, which was off and began "playing" the keys. [Mom] turned it on and asked Ashlee if she was playing the piano. Ashlee looked up at her and smiled and then continued to move her hands on the keys. This time they made sound and Ashlee smiled. She looked up at [Mom] again and [Mom] commented, "I see you're playing the piano! Can you hear it now?" Ashlee smiled again and began pressing the buttons on the

keyboard. She hit one and it began automatically playing a song. Ashlee stood up and bounced up and down, while waving her arms in the air, as if she was dancing. (I love watching Ashlee explore the keyboard. I hope she finds a love of music from a young age).

Because she associates the keyboard as her pathway to musical sounds, she will bounce or move near the keyboard or on it, signaling her parents to turn it on as per her request. Using other body parts to play the keys, Ashlee seems to eventually figure out how to turn on the pre-recorded music and responds immediately.

Episode 31, Parent Diary:

[Ashlee's paternal grandfather] in our living room at the keyboard.

Ashlee approached the keyboard in the living room and sat on it. She bounced up and down and [Mom] asked if she wanted to turn it on. Ashlee reached for the button and [Mom] helped her turn it on. Ashlee crawled on the keyboard as she pressed the keys with her knees. At one point she hit one of the buttons that makes it play a beat. She stood up and bounced up and down to the beat, waving her arms in the air.

While Ashlee's behavior around the keyboard includes both playing and moving, she seems to receive satisfaction when she makes sounds with it. For her, it is creating the musical sounds that make her feel proud and her ownership to the musical output contributes to her a sense of agency in her own music making. By being in control, her ownership brings a sense of excitement to the whole family.

Dad: Do we have a favorite musical activity? I don't know. Do we have a favorite musical activity?

Mom: She likes to dance.

Dad: I mean, letting her play keyboard is pretty exciting.

Nita: You mentioned that earlier, yeah.

Dad: She's as enthusiastic about anything. She's very proud of herself when she makes something happen on the keyboard, any kind of noise. Just watching her do that is ... Just letting her create, is enough of an activity, I think, for all three of us.

Home and school influences. At school, there is a "tiger piano" in the infant room that functions as a xylophone and as a keyboard by pressing keys to make tones. Having observed and played the keyboard with her mother at home, Ashlee takes on some of the piano-esque mannerisms from home into the classroom. In this episode, Ashlee's mother watched as she prepared her fingers for play, experimenting with different ways to create sound on the tiger piano, ultimately responding to it with movement, as she does at home:

Episode 16, Parent Diary:

Ashlee, [Mom], [HT1], a few infants in the infant room.

I arrived in the infant room to drop off Ashlee. After getting her things unpacked, Ashlee crawled to the tiger keyboard. She began moving her fingers individually, as if playing the piano. This did not create sound, as she was not pushing hard enough. She then changed strategies and began banging on the keys. This produced a sound and Ashlee continued banging on the keys for several minutes. At times, she stood and other [time]s she squatted. Once or twice the keyboard tipped a bit, but she set it back and continued to bang on the keys. As she did this she smiled and bounced up and down.

It was interesting to me that she initially approached this as if playing the piano. I'm not sure if she noticed me doing that when I play the keyboard, but she doesn't do it herself on our keyboard. I also thought it was interesting that she changed strategies when it wasn't producing sound, as if she already knew it was supposed to do so (I'm sure she's used this toy before).

Ashlee's association of the instrument at home and at school propelled her to try out various ways of playing in order to create sound. Her perseverance possibly displays the strong association of the two instruments, although in different contexts, in that she has

made a connection and applied her knowledge of playing. She brings musical elements from home into the classroom.

Ashlee shares and practices some of her music skills at home that were introduced in the infant room. One morning, her father was pleasantly surprised when Ashlee clapped on cue, when they sang “If You’re Happy and You Know It.” This song is often sung and played in the infant room, and Ashlee and her peers will join in with the musical gestures. Her father’s laughter indicated his surprise. The peek-a-boo scarf song from music time is an activity that seems to end up not only in the infant room outside of music time, but also at home. Ashlee found a blanket at home instead of a scarf to initiate the musical activity with her mother.

Episode 25, Parent Diary:

[Mom] and Ashlee, In the playroom/bedroom.

Ashlee was playing and found a blanket. She placed it over her head and left it there for a few seconds. [Mom] began singing, “Where is Ashlee, wish I knew, pull down the scarf and say peek-a-boo.” Ashlee then pulled the blanket off and giggled. They continued this game for a few rounds, each time, Ashlee laughed as the blanket was pulled off. Ashlee seems to know this song from school and enjoyed engaging in this back and forth game.

This musical conversation and play that took place was possible due to her mother’s recognition and immediate response to this activity since she is herself an infant room head teacher. In both instances, Ashlee brings home songs learned at school, shares them with her parents, and practices her gestures and movements, reinforcing her musical development. By finding a blanket, she has made the connection to bring school home and to share what is meaningful and special to Ashlee with her parents. With the tiger piano, clapping song, and scarf song, Ashlee transfers her musical skills to different contexts using materials and resources she has available. Making the connection between

them, she applies her knowledge until she is able to achieve a satisfactory outcome, in her case, creating sounds. She seems to enjoy sharing these experiences.

Listening and being moved. Moving and dancing to music were the prevalent musical behaviors for Ashlee, along with instrument playing and movement combined.

Listening ranked high, as both parents sang to and played music for Ashlee often.

Bedtime routines were also moments where parents could bond with Ashlee. Ashlee's mother recalled the specialness of having private music time between parent and infant:

Yeah, that's one on one time. When she was really little, I was nursing her all the time and I was feeding her a lot, so it was a time for her and [Dad] to bond. Their time to dance and sing was his way of calming her when she'd already been fed, and she was just really fussy. I think it's just always been a thing that we do with her; a way for her to have one on one time with each of us.

Ashlee's mother will often hum spontaneous tunes to Ashlee while rocking her to sleep.

Her mother described a moment where Ashlee had a particularly difficult time settling down to sleep, and the combined action of humming a made-up song and moving Ashlee eventually soothed her to sleep, while providing her mother with a private bonding moment.

Episode 18, Parent Diary:

[Mom] and Ashlee in her bedroom.

Ashlee seemed very upset while going down for her nap, which is unusual for her. I had placed her in the crib, but she cried hard and stood up. In general, she just lays down and goes to sleep. I went back in and picked her up and sat with her in the rocking chair. I began rocking her and humming a song that I made up when she wouldn't settle down as a tiny baby. The song has evolved and changed and sometimes I sing it slightly differently, but it's roughly the same tune. As I rocked her and hummed, she curled up and easily went to sleep. I don't often rock Ashlee anymore as she tends to prefer to just be placed in her crib. It was sweet, and I enjoyed the cuddles I got with her in that moment. She rarely stays in one place these days, so cuddles are fast and fleeting.

Ashlee's mother has also hummed and moved Ashlee in other contexts outside of the home, for example in the subway. In this diary entry, the subway car was crowded, and the train was delayed due to a track fire. As the delay lengthened, Ashlee became more distressed. Her mother then stood up (she had been sitting) and bounced Ashlee up and down while humming in her ear. This calmed Ashlee down and she relaxed a bit as they continued to wait for the train to move. This act of moving Ashlee and humming intimately to her worked for Ashlee. The act of quiet humming seems to be like a secret musical conversation between the two.

Another episode took place during the last swim class that Ashlee and her mother attended. The instructor and class sang "Row your Boat," a particular favorite of the infants during this study, while the child sits on a surfboard before jumping into the water.

Episode 30, Parent Diary: Ashlee sang along to the "Row Row Row" part and rocked her body back and forth. The instructor sang it three times and on the third time the kids jump into the water. As Ashlee fell into my arms, she realized the song was over and said, "Ma! Ma!" while signing "more". I explained that we weren't going to sing it again and Ashlee began to cry a little. I hummed it to her quietly while we moved onto the next activity and this seemed to calm her down.

The well-known signal for "more" used in the infant room and also at home lets her parent know her request. As she became upset that the song is done, her mother calmed her down by humming again in the intimate way, like the secret between them, that appeased Ashlee.

When Dad is alone with Ashlee, they usually listen to music after dinner as a way to spend time together and prepare for bedtime. They dance and bounce to some music, which seems to calm Ashlee and transition her from dinner to bedtime. The following diary entry describes the intensity of the focus between father and infant.

Episode 28, Parent Diary, April 6: Dad and Ashlee are together just before bedtime in the nursery. After Ashlee has her bottle she plays a little more and then Dad gets her into pajamas and ready for sleep. The regular background music plays, and Dad sings a little while rocking Ashlee for a few minutes after she is in her sleep sack. They make eye contact while Ashlee sucks on her fingers and holds her bunny. It's only half a song or nearly a whole song before bed that Ashlee and Dad have focused in together with just the music. Ashlee signals for the crib when she is ready, and Dad puts her down and turns the stereo off.

It seems their world at this time was surrounded by a quiet musical intensity. Looking into each other's eyes created an unspoken communication, and music was the thread that held their focus. The silent reciprocity of thought moves between them, transitioning Ashlee to provide the signal that she is ready to be on her own.

Teachers' Lens: Musical Ashlee at School

At school, Ashlee's most prevalent behaviors were vocal, followed by movement and listening. Communication and comfort were the most prevalent functions identified at school, along with a few that were undetermined. While vocal behaviors were spread out over the functions (comfort, communicate, motor, explore, undetermined), movement and listening were mostly paired with communication.

Unique vocal sounds. Ashlee's babbling sounds musical. Her mother described it as containing, "different sounds and lots of intonation" (Episode 4). She and her mother have engaged in conversational babbling, where Ashlee babbles in a sing-song voice and her mother sings back to her, continuing this call and response for some time. At school, her teachers describe her babbling as musical in that it sounds rhythmic and melodic. Her mother and GA1 both have both said they have not heard this type of vocalization before, as it has a unique style.

Ashlee has this really unique babble. This talk that she has. I don't know if you've heard it but she does it a lot. She may be doing it while she's doing

something or while she's walking or while she's sitting. It's just this very like intricate babble that comes out of her mouth. It's very musical. I don't know.
(GA1)

I delved further by asking GA1 more about the musical sound of her babble, and she described her babbling as lasting for some time, and that she had never heard another baby talk in that way. During our second interview, HT2 mentioned Ashlee's unique babble and that her singing sounded as if she has a song in her head. It is difficult at times to distinguish between speech and song; however, the sing-song nature leans more towards musical babbling or song. HT2 described Ashlee's vocalizing one afternoon in the playground when Ashlee sang in the swing. Another practicum teacher took a video of this moment and could not decipher the song Ashlee was singing at the time:

Yeah. She took it at the park while she was in the swing, and she's just trying to figure out the song that she's singing. She's babbling and there's rhythm to it and she's got hand motions to it and we have no idea what song it is, because then she moves in from that one to Twinkle Twinkle. You can understand Twinkle Twinkle. That one's clear, but this one other one, the practicum student is like, "I don't know." (HT2)

Having seen the video, I also had a difficult time figuring out the song. After a while, it sounded like musical babble with repeated song fragments. Ashlee was singing while swinging, however the gestures hinted at something more. After showing the video to her mother, the longer we looked at it the more it sounded like "Wheels on the Bus," with accompanying hand movements. Her babbling and singing mixed in together made for very interesting sound colors. Although it was difficult to discern the song at first, it was there.

With her peers, Ashlee engaged with others through her vocalizations. Towards the end of the study, HT2 reported that Ashlee would often begin singing in order to engage Max or Devynn. Ashlee also discovered other ways to create unique vocal sounds

by joining her peers. Her mother mentioned in our interview that Ashlee generally positions herself with the older, more mobile children. In the infant room, this would include Frederic, Cyndi, Lily, and Benny. She would generally follow them around to see what was happening in the classroom. In the following episode, Benny initiated a new sound by trilling his lips against an object in the classroom. Others followed suit:

One time I remember this anecdote, it was Cyndi, Lily, and Benny and even Ashlee came, they were playing with some pop beads or I don't know. They had some holes, like connecting cubes or something, and they will hold them and they will do a sound "abrrrr" (lip trill) with the toy in their mouth. They all started to do the same thing. (GA2)

Joining the group, Ashlee was part of this kind of contemporary vocal ensemble, discovering new ways of vocalizing and practicing it, while being part of the whole.

Ashlee's unique vocal babbling seems to occur at various times throughout her play. Having heard her babbling, it emanates a sense of warmth, like a special companion providing friendship. At times when she initiates singing, she is trying to bring in her peers to her play. When others initiate, she joins them in the musical space. The swing and sing episode provides a musical space for Ashlee; in this case, she sings phrases repeatedly to accompany the repeated movement the swing brings. The movement of the swing seems to become the musical phrase with repeats as she inserts her musical line. Towards the end of the video, she sounds slightly fussy before repeating more elongated tones, as if being relaxed with the swinging movement. Perhaps this movement is similar to the way she is moved by her parents when engaged in song.

Requesting by gesture. Ashlee enjoys dancing and moving to music at school just as she does at home. During the study, Ashlee learned how to stand on her own and take steps, which allows her to respond to music using her body in more ways. She

participated in music with movements and gestures with songs like “Wheels on the Bus” and “Row Your Boat.” When Ashlee liked a particular musical activity, she makes a vocal sound like she is slightly upset, or she furrows her eyebrows. This facial gesture is inquisitive in nature and wants more of a musical activity. GA1 translated it as, “Yeah. Yeah! When she’s like, you know. How did that happen? Do it again, more please. Like, trying to figure it out.” Another way of using movement to request music is by doing the action of the song. In “Row Your Boat,” she would often make the rocking motion while verbally babbling a request for the song. HT1 described in our second interview how her musical behaviors have evolved since beginning of the study:

I also started doing “Row, Row, Row Your Boat” with her and she’ll say when I’m finished with the song she’ll go, “Row row? Row row?” (Nita: Now she’ll ask for it?) Yeah, and she’ll start rocking. (HT1)

This song was a favorite in the classroom, and Ashlee also requested it from her mother during the swim episode by rocking on the surfboard. Using the one-syllable word and movement, she was able to get her message across.

Attraction to sounds brings about responsive listening. In the infant room, Ashlee enjoys listening to her caregivers sing to her while she is being rocked. She will also initiate song by bringing a particular songbook to a teacher; a favorite in the classroom was the *Old MacDonald Puppet* book. At other times teachers reported that Ashlee was instantly attracted to the group upon hearing the text of the *Pout Pout Fish* book. HT1 reported that *Pout Pout Fish* has a, “very rhythmic beat” and Ashlee becomes very excited upon hearing the text from the book. GA2 elaborated on how Ashlee will stop whatever she is doing to get a closer listen to the book.

Some books, you know, just the nature of the books that rhyme or they’re a little bit sing-songy-ish. There’s the pout-pout fish, which Ashlee-Loves, loves, loves,

loves, loves. ... I will be reading that on the other side of the classroom to an infant, she will make her way over and sit in my lap or stand and watch. Like it doesn't matter what she's doing, she can be in the middle of doing something else. As soon as she hears words from the pout-pout fish. Yeah, she loves pout-pout fish. I feel like she has for a really long time. I went to babysit her one night, when she was maybe not even five months. They had the pout-pout fish at home and I read her the book. She just looked at the pages the whole time. I was like, "Wow. Her parents must read this a lot. She's familiar with it already." (GA1)

HT2 described Ashlee's attraction to song in that, "anytime a song is being sung she's there." While *Pout Pout Fish* is not a song, but a chanted rhyme-story, there seems to be a musical quality similar to song that grabs Ashlee's attention and ultimately engagement. She would join the area where Pout Pout was happening and be with others during this musical sharing moment.

Researcher's Lens: Peeking into the Infant Room

During field observations, Ashlee exhibited a high number of vocal behaviors; the remaining three types of behaviors were also substantial, and frequencies were evenly spread amongst them. Communication was the most identified function in this setting. Comfort and exploration in this setting were also prominent.

Listening and singing during diaper changes. Teachers in the infant room sang or spoke in a musical way to Ashlee during diaper changes, and there were instances when Ashlee engaged in musical conversations while on the changing table. In one episode, HT1 sang through a few songs like "Twinkle, Twinkle" and "Wheels on the Bus" as a way to soothe Ashlee who was crying on the table. In another episode GA2 started out with "Twinkle, Twinkle" and when that did not stop Ashlee's crying, she started saying, "Where's Ashlee? There she is," in a sing-song musical way, where her voice contours up then back down, and while stretching out the word, "is" (Episode 55);

she followed through by singing “Old MacDonald,” and Ashlee stopped crying. In another episode (Episode 57), GA2 sings “Itsy Bitsy Spider” and Ashlee is quiet during the change and responds with a few vocalizations. To indicate that the change was finished, GA2 says, “all done” in a descending slide before singing a line from a children’s song, as she helped Ashlee get dressed. GA2 in these cases carried out song/musical chanting throughout the process with a variety of song selections. During one observation, GA2 used the hello/mirror song from music class.

When using the spoken/chant voice, the following episode depicts how a teacher also tries out song and chant to soothe Ashlee:

Episode 49, Researcher Report: HT2 takes Ashlee to the changing station; Ashlee reaches for the mobile above her and says “deh, deh, deh,” and she also starts to make sounds that sound like she is complaining. HT2 begins to sing to her. As Ashlee continues to cry, HT2 changes her voice, higher pitched, sing songy before saying “shake, shake, shake,” and she repeats “shake, shake, shake” a few more times. Ashlee has her hand in her mouth and makes sounds while her hand covers and uncovers her mouth.

The head teacher adjusted her pitch and chanted another frequently used phrase in the infant room, “shake, shake, shake.” Ashlee responded by using her hands to create new sounds during the changing. In the following episode, Ashlee had just finished her bottle, and she cries before HT2 takes her for a diaper change. HT2 begins by responding to the vocalization Ashlee makes right before going to the changing station.

Episode 59, Researcher Report: Ashlee finishes her bottle (fast), Frederic stops crying, and Ashlee starts crying. HT2 moves to collect Ashlee to change her diaper. Frederic is heard crying again. Ashlee vocalizes, “deedle deeble” in a sing songy up-down-up-down pattern. HT2 imitates her; puts her on the changing table. She continues making the sound and laughs. HT2 changes her. Frederic stops crying.

As HT2 says, “deh deh deh” in response to Ashlee, Ashlee says, “dah dah dah!” in a forte, then, “ada!” then she lip trills and HT2 does it with her. They alternate and have a lip trill conversation. Max is being fed his bottle. Ashlee and HT2

continue their conversation with the sing songy, “bidle bidle” and, “dih dih dih,” as Ashlee takes her hand and squeezes her hand open and shut.

Max finished his bottle. Both Ashlee and Max make babbling sounds.

HT2 puts her in her sleep sheet, and she sings “Good night Ashlee, we’ll see you next...” (the tune of the music class goodbye song). She is quiet but interjects an, “ahhhh” softly.

HT2 begins the musical conversation by taking Ashlee’s initial sounds and repeats them back to her. Here, the teacher has taken Ashlee’s musical idea and brought it to the changing table. They continue this musical conversation using a variety of syllables and sounds and at one point, Ashlee gestures with her hand, opening and shutting them, which could possibly have been part of “Wheels on the Bus.” Following through, the teacher uses a music class song before putting Ashlee in the crib room for her nap.

While Ashlee only appeared a little distressed after her bottle, it was uncertain whether HT2 might have continued the musical interaction, as it appeared in the previous episodes where teachers initiated the musical moments while Ashlee was crying. When teachers allow for these musical moments to happen during changing, they choose from a variety of songs and chanting of syllables or words. During these instances, there is a musical space where Ashlee responded back musically and even found and created new sounds and ways of musically speaking with her teachers.

Trampoline attraction. For a period of time, the mini trampoline became part of the infant room. With a handrail and pillows surrounding all sides, infants can safely figure out how to get on and off of it while exploring what they can do on it physically. This object also seems to be a platform where infants act out musical behaviors. Ashlee has visited the trampoline and bounced on it while seated or on her knees while simultaneously vocalizing to her movements. She has also approached the trampoline

while holding a plastic container with lit objects in it. During this observation, she sits on the trampoline and begins to shake the object repeatedly, while watching the items in the bottle move. The trampoline is also a place where she can interact with others. In the following episode, Ashlee has just finished having her bottle and crawls over to the trampoline.

Episode 54, Researcher Report: There is faint music heard in the background now; someone turned on the music and it is playing softly. Ashlee is done with her bottle, and she crawls to the trampoline happily. The teacher sitting next to it taps the trampoline and says, “bounce, bounce, bounce” (do re mi), and they take a few turns tapping the trampoline. The teacher sings, “one foot” and a few other words to Ashlee, and Ashlee stops to smile at her and is engaged with the teacher’s singing.

I presume the teacher taps the trampoline in order to point out to Ashlee that she can bounce on it; she also sings “bounce” on do, re, mi, which seems to invite Ashlee to join in and tap with her. The teacher continues to sing various words, and Ashlee shows her pleasure at her singing. It seems the trampoline invited this adult to engage in musical behaviors in order to draw in Ashlee into their interaction.

As Ashlee experiences bouncing on the trampoline, she accompanies the movement by singing, “ah.” It seems as if she is coordinating her sound with her movement. When playing/shaking an object, she might be experiencing some associated movement due to her shaking movements on the trampoline. When tapping with the teacher, the teacher appeared to have invited Ashlee to join her in the musical behaviors.

Instrument play to accompany the infant room. At times during observations, the infant room is serene, with a few babies awake and exploring their environment. Other times, there were many different things happening at the same time. During times when different musical things take place simultaneously, it sounds like a mash-up of

different musics, with different behaviors, and different contexts all within the same setting. If I were present in the room, it would sound like listening to sound in stereo. In these cases, teachers are tending to infants and these individual musical moments contribute to the whole. The following two episodes portray many events happening in the infant room, and Ashlee in both episodes obtains a shaker to play:

Episode 51, Researcher Report: Lily is holding herself up on the trampoline bar and sings a fragment of an unknown tune. Benny sits next to Lily on the trampoline and makes “bo bo” sounds. Lily practices saying “balloon” with GA1. Lily holds the Old MacDonald puppet book, GA1 asks, “do you want to sing Old MacDonald?” As they begin singing, Lily on cue makes the quack sound. Ashlee is near the baskets and takes out and shakes the wooden shaker repeatedly.

Episode 66, Researcher Report: A practicum student is changing Frederic and singing Wheels on the Bus. Max is sitting on HT2’s lap against the wall; he has just woken up. Lily says “wah wah wah,” as if going along with the song. HT2 is now singing Wheels on the Bus to Lily who says, “a bah!” a few times. HT2 tells her to look for a bus. Cyndi and Ashlee are around.

Cyndi comes to HT2 and gestures her hands like clapping, but it is more like wipers on the bus (swish), since HT2 is singing that part. As HT2 sings about seatbelts going snap on the bus, Lily sings “wah wah wah” with her on the snap, snap, snap segment, and Cyndi claps her hands almost in rhythm.

Ashlee went to the basket and pulled out a maraca/shaker and plays it.

A practicum student is reading a book about the alphabet to Frederic, Ashlee, and Cyndi. Lily sits on the sofa. Max is still on HT2’s lap, slowly becoming more awake. The practicum teacher is now reading/singing This Old Man. Ashlee joins, and Cyndi is sitting next to her going thru another book. Ashlee walks over to Max and HT2.

While many musical events happen separately in the infant room, they happen quickly and simultaneously. Field notes might cover a brief time span, for example 30 minutes, and even so, I could not have covered all of the events happening at the same time. With such musical fullness that occupies the room, it is possible that the influence of the environment added to Ashlee’s choice to play the shaker in those moments. From an

observer outside of the classroom, and especially in the listening booth where sight lines might not be as clear as the sounds I hear through the headphones, my ears captured Ashlee accompanying the ubiquitous and varied musics around her.

Music Teacher's Lens: Group Music

For Ashlee, vocal and movement were the predominant behaviors during music time. These behaviors were strongly associated with communicating with others.

Imitating and partnering during singing. During music time, Ashlee seems to imitate and even closely match pitch with others. In the following episode, GA1 says Ashlee's name to designate her turn during our hello song with the mirror. Before we begin the song, we hear an imitation of the same pitch GA1 sang:

Episode 74, Researcher Report: GA1 sings Ashlee's name in a descending minor 3rd interval. I hear a baby sing, "mum mum" on a m3, similarly matching GA1's interval. Is it Ashlee? It does not sound like the older infant voices, and the youngest has been making her distinct vocal sounds, and Max usually makes different types of sounds. So, I think this is Ashlee.

After we (adults) sing peek-a-boo on cue, I hear an imitation of, "peek a boo" vocally, without enunciation on a minor 3rd descending interval, lower than we sang it. I think it's Ashlee, because at that moment, HT2 and I looked immediately to Ashlee, and I followed up by asking if Ashlee wanted to have a turn next.

I was able to narrow down Ashlee as the one who matched the interval. Later on, in the same episode during the scarf song, she sings sol-mi again. Since HT2 and I looked in her direction, and because I asked Ashlee if she wanted to have a turn next, I took her sol-mi as a cue to offer her a turn. The next episode indirectly suggests that I am matching Ashlee's pitch. We had just finished singing songs with shakers, and I brought out the scarf for the peek-a-boo song, and Lily volunteers to go first. Ashlee is on the carpet near me, vocalizing a few pitches:

Episode 76, Researcher Report: As Lily gets the scarf to put on her own head, Ashlee shakes her shakers and makes vocalizations that sound like the same contour and pitch (first two notes, the interval is correct) of the scarf song: “where is ___wish I knew...” I start singing to Lily and the pitches sound similar to Ashlee’s. Am I subliminally taking pitch from Ashlee?

Perhaps it was not conscious on my part to start the song using Ashlee’s recommended pitches, however it seemed to me that the intervals were so close. While Ashlee might have noticed the scarf on Lily, it seemed to me she was vocalizing pitches while she was playing her shakers. The intervals were correct to my ears, and I used it to start the activity.

Within the context of “Twinkle, Twinkle,” the following episode shows how Lily sings along to the song as we explore instruments. Ashlee also joins in singing “Twinkle, Twinkle,” within the same key that was established. While the busyness of the music-making is happening for each infant, the Twinkle fragments continue to be heard throughout.

Episode 78, Researcher Report with Video Timestamp:

20:27 Lily sings, “how I wonder...” while holding the bell. She has a huge smile.

20:45 Lily, “how I wonder...”

20:54 Ashlee makes some singing sounds, too.

20:55 Devynn makes a loud elongated sound while shaking the shakers.

21:00-21:12 Ashlee is singing the melody from Twinkle loudly. Benny and Frederic are sitting in a practicum student’s lap together. Lily holds a finger cymbal and sings part of Twinkle.

21:30 Then she says, “up above, up above” as a fieldwork music student fixes it.

21:53-22:09 Lily sings the words loudly.

22:05 Ashlee sings, “up above.”

22:30-23:31 Lily continues singing (around and with the fieldwork music student); the music student takes the bell and starts to tap and sing and tap the shaker against it; then Lily taps the shaker and bell together as she sings.

23:14 Cyndi brings the basket of shakers into the tent and collects the other shakers that were left in there (by whom?)/ (Does she always set things right?).

23:53 Ashlee sings, “up above” while we are singing shake and stop.

Similar to fieldwork observations during infant play, music time can also encompass a vast array of musical activities taking place. This particular episode shows that within the combinations of mixed musical events happening, the collective is making music with, within, and between each other.

Moving and singing with others. During the opening dancing segment of music class, Ashlee interacts with others by gesturing to her peers by pointing or reaching out towards them while a teacher is holding her and dancing. Ashlee also brings in her bunny to the music group. While I was dancing with Frederic during one episode, Ashlee and Bunny joined us at the end of the dancing segment. Knowing that her bunny was important to Ashlee, we brought Bunny to the group circle as we began our hello song. During this activity Ashlee bounced and moved to the beat and participated by clapping along. At one point, she also bounced Bunny to the hello song.

During the dance segments, Ashlee also sings while a teacher holds her. During one episode (Episode 80) we played “Shake it Off” from the movie *Sing*. A teacher is holding her, and she sings, “ahhh” while her teacher makes shaking movements to go along with the song. It is also at this moment in the song that the lyrics are, “shake it off, ah ah”; while it was not certain whether Ashlee could have been singing along with the “ah” lyric, at the end of the song she said, “more,” indicating she either enjoyed the song or the dance component.

The active and busy nature of music making allows space for all sorts of musical behaviors. The following episode describes Ashlee singing and moving throughout this scene along with her peers.

Episode 81, Researcher Report with Timestamp:

I ask Frederic if we should do it again (I am singing Twinkle).

18:00-18:39 Frederic dances with his shakers; Benny goes into the rocker and rocks, and Lily sings “up above”; during “like a diamond” someone is singing (is it Lily or Ashlee?). Ashlee tries to go into the rocker with Benny and he says, “ahhh,” “no” and shakes his head, “no” while he is on all fours. Ashlee sits back and looks at him. Lily sings the end of the song with me in a quieter voice.

18:38 Ashlee is singing. Benny embraces Ashlee and kisses her. As GA1 gets up to tend to them, Benny leaves the rocker and Ashlee crawls right into it; Frederic continues dancing. Lily says, “more.” Per Lily’s request, I continue singing Twinkle, Twinkle.

19:07 Both Ashlee and Benny are in the rocker. Ashlee says, “wo” as she rocks (requesting Row Your Boat), and Benny makes vocal sounds. Frederic dances behind them.

19:16 I hear, “ahee” similar to the pitch and lyric, “sky” as I sing, “in the sky”? (Is this Ashlee?)

19:22 Ashlee is now patsching; Benny brings a drink bottle to Ashlee. She takes it. HT2 tells Benny it’s Devynn’s water bottle. Ashlee laughs and taps it and almost puts it in her mouth before GA1 takes it.

20:06 Frederic lets me put the scarf on him, Benny takes it off and says, “ooh” to him.

20:33 Benny puts the scarf on Lily (I thought he wanted to put it on himself).

21:25 I hear a fragment of Twinkle, Twinkle from Ashlee.

27:55 (Singing row your boat with the book) I sing, “roar”; a moment later, Ashlee says, “ah,” sounding similar to, “roar.”

28:00 Max is rocking side to side

With her peers, Ashlee is singing and moving to music on her own and with others, requesting songs, and she is part of the whole music making scene with her peers. The rich and complex nature of the music making shows a mutual respect for the individual choices of music making along with being part of the community.

Summary of Ashlee

At home, Ashlee often plays the keyboard. By physically engaging with it, she signals to her mother her request to turn it on. While playing, she explores the keyboard alone and with others nearby. Upon getting the keyboard to play recorded music, she dances to her own selection. As she entertains herself, she experiences a sense of comfort through her achievements that are supported by her parents' enthusiasm and encouragement. By moving and dancing to her created sounds, she communicates her pleasure and music making with those around her. Ashlee makes associations between instruments in different contexts and will also bring home and share song activities from school to home. When Ashlee is upset, the act of singing or humming to her along with rocking her will soothe her when she is distressed or prepare her for bedtime. These moments with her parents also provide a sense of closeness. The focus during the private time allows for communication of reciprocal thoughts and feelings, almost like a back and forth conversation with only the eyes and feeling, as singing or background music provides the accompaniment.

At school, teachers noticed Ashlee's conversational babbling and that the vocalizations she makes are unique. She has also joined her peers in exploring a different type of sounds while using material in the classroom. Ashlee relies on her musical movements and facial gestures in tandem with song and verbal cues to let adults know

the song she is requesting. Participating in action songs with others was also a way for her to communicate musically with others. She has a particular facial expression that indicates her curiosity and interest in something, including music, which leads her to ask for more. When hearing text read aloud from a familiar book, the musical nature of the rhythm and rhyme of the text attracts her to the sound source, joining her peers.

During field observations, musical interactions take place during diaper changes, which allow for exploration of sounds and communication, as well as providing comfort for Ashlee. Objects in the classroom, like the trampoline, seemed to attract musical behaviors from both the teachers and the infant. With a vast array of individual music filling the infant room, engaging in musical play is possibly a way of accompanying and riding the waves of musical variety occurring simultaneously. A musical environment that accommodates infants expressing themselves individually according to their musical choices can still fit together as being individual parts of the whole—the musical infant community.

Devynn: The Motivated Musicker

Parents' Lens: Musical Devynn at Home

Devynn was 6 months old at the start of the study on the cusp of turning 7 months. Her parents are from Ireland and they speak and sing to Devynn in English and Gaelic. Devynn's mother listens to music often and will put on music in the background, usually an Irish language station. Devynn's grandparents enjoy listening to classical music, and her grandfather will play recordings of classical music for Devynn when they visit. Both parents actively make music with Devynn, dancing with her, singing to her,

and providing objects for musical play, including a bee shaker and measuring spoons. In the home environment, Devynn's reported musical behaviors were spread evenly throughout, with communication being the top function, followed by comforting/entertaining self.

The interview took place in Devynn's living room with her mother. They had just moved in to the apartment a few weeks before. Devynn, propped up against a large U-shaped pillow, was within reach of a few objects on the cyan colored rug. A few baskets were nearby full of her toys and books. Devynn's mother and I sat on the rug. Devynn smiled frequently and interacted vocally with her mother during my visit.

Vocal sounds with instrument play. Devynn frequently vocalizes unvoiced raspberries. Throughout the interview, Devynn made this sound, and her mother felt that it might have a soothing effect that provides comfort and enjoyment. Her vocalizations also accompany her movement and instrument play, for example, vocalizing on, "woo woo" while bouncing. During instrument play, her mother describes how her vocalizations sound musical:

Mom: She might be lying on the ground and she'll take [an object] and shake it. Also, verbalize something with it, but I don't know if you can call that music. I'm not sure... Yeah. I think it's more music than talk. I think there's sometimes where she's more talking than making music, so I think that those times are a bit more ...

Nita: What differentiates that for you?

Mom: The talking seems like it's more isolated syllables like, "Duh, duh" or "Guh, guh," whereas the music bits are more like longer and seem more joined together and there's more of like a pattern to it.

Devynn plays objects together while rolling on her front and back in between playing. A parent diary entry (Episode 22) describes Devynn vocalizing during syllables like, "guh"

and high-pitched screams while moving and playing: “She hit the two of them (objects) together eight or nine times, then rolled onto her front, hit them together a few more times, rolled onto her back again and hit them together seven or eight more times.” It seems as if her repetitive movements and playing become the musical pattern while her vocalization accompanies. In her walker, there are buttons she can touch that play music. In one episode (27), while she was in her walker, she responded to her self-initiated music by banging along and, “making a singsong/shout sound for about 15 seconds. Then she continued to press buttons as it played music.” It seems the repetitive nature of playing the buttons and musically responding to it becomes the musical pattern. One diary entry reported Devynn creating a pattern.

Episode 19 Parent Diary, March 9, afternoon:

Who: granny and mum

Where: at home in living room

Devynn was lying with her back on the ground - she picked up the shaker and shook it a few times she then started to make a constant sound almost like a chanting while staring up to the ceiling and started banging the rattle on the ground to the left side of her head. She did this 4/5 times in succession then paused and repeated 4/5 bangs, paused - she repeated this 4 or five times while continuing to chant. I noticed this because it was a repetitive pattern – I’m not sure whether she noticed it or not but it definitely seemed like a rhythm.

Devynn’s mother described elongated sounds that connect with a pattern as a musical vocalization. In this episode, Devynn’s chant seems to fit this description, as she plays her instrument, creating a rhythm in the process. The episodes above show how Devynn creates patterns with her musical behaviors during solitary musical play. The repetitive nature of her behaviors seems to reflect enjoyment and discovery at the same time, while sounding musical.

Responses to sound. Devynn has a few musical toys that grab her attention, one of which is a bee shaker. Her mother described how she loves hearing the sound of this shaker, as the beads inside sound similar to a rain cheer. During the interview, Devynn's mom pulled out various sound making toys that Devynn enjoys, all making different types of sounds. Devynn's mom describes her responses to music as pausing to listen with a smile or laugh, which is usually accompanied by movement. In a few episodes that include Devynn's father, he describes in a diary entry how Devynn seems curious of the sound source when he hums or sings to her during her bottle feeding:

Episode 14, Parent Diary, 7:30 a.m.:

Who: Devynn (7 months), Dad

Where: Living room sitting on couch after having her first bottle

Devynn was sitting on my lap after her bottle and I started singing to her. I don't know very many songs so often I end up mixing and matching words and sounds. Devynn very intently looked at my mouth moving and reached up with her hands to touch my mouth. She really seemed to have her attention focused exclusively on my mouth, almost like she was trying to find out where the sounds were coming from.

Devynn's gesture of reaching up to her father seems to indicate she knows where the sound is coming from, but would like to touch the sound, or sound source (mouth). About a month later, another diary entry describes how Devynn responds vocally:

Episode 20, Parent Diary, April 1:

Where: With Dad, at home

Devynn was sitting on my lap early in the morning (6:30 a.m.) having her first bottle. When I started humming to her she pushed the bottle away from her mouth, reached up towards my mouth, looking at my mouth moving and gave me a smile and made a, "ga ga" sound. Then she continued drinking her bottle.

Dad's humming/singing seems to be a common occurrence during bottle feeding. In earlier episodes, Devynn reaches towards her father's mouth giving her father the impression that she is figuring out the sound source. In this episode, it seems that while still curious, she interrupts her bottle time in order to interact with the sound, almost like she is acknowledging it.

Listening to digital music also grabs Devynn's attention. Two episodes where Devynn responds through bouncing movements are described.

Episode 17, Parent Diary, March 5, 3 p.m:

Who: Mum and dad

Where: at home

My friend had edited a video of Devynn rolling around on the floor to some classical music to make it look like Devynn was doing a dance routine and I played it on my phone for Devynn. She got very excited and started bouncing on my knee and moving her arms up and down. She then started forcefully reaching for the phone. I replayed it three or four times with the same response each time. Devynn seemed to like the music (and probably the light) – she was really interested in it. I will email you the video.

In another diary entry dated April 28 (episode 24), Devynn's mother played "No Vacancy" by One Republic on her laptop, and Devynn, "stopped in her tracks and turned around to where the music was coming from." At this point, Mom moved her upper body and arms to the music and Devynn responded by giving a big smile and bounced on her knees. In the episode where Devynn is responding to the video of herself, the music playing during that video is the "Danube Waltz." In episode 17, popular music was playing. Devynn's mother will often play music that she listens to for Devynn, for example the Irish band, Kodaline.

Another instance where Devynn will stop what she is doing to seek out the sound source involves her physically moving towards the sound. This episode describes her crawling and takes place towards the end of the study, when she was about 10 months old.

Episode 28 Diary Entry, Parent Diary, May 4, 5:30 p.m:

Who: Mom and Devynn

Where: We were in the living room of our apartment.

Devynn was on the floor of the living room with a saucepan she was putting toys into and taking them back out. I turned on some music on my laptop. When Devynn heard the music she stopped what she was doing, and army crawled over to the couch to where I was sitting, then pulled herself up to a standing position beside me to see where the music was coming from. She smiled at me and moved back and forth a bit before sitting down. She then crawled around to get closer to me, looking up and smiling at me. I asked her if she liked the music and she smiled and made some sounds like, “da da.”

In these scenes, Devynn seeks out the sound she hears by gesturing, bouncing in place, or moving. During these times, she also acknowledges and interacts with her parents.

Devynn creates sounds with objects. During the interview, her mother described how Devynn would take her pacifier and clink it against the bars of the crib. Her mother referred to “those old movies where the inmates in a prison will be clinking their jars” in the jail cell. When creating her own sounds through playing, her vocal responses seem to intensify. A couple of episodes describe Devynn on the floor playing objects. She responds vocally to her sound-making, and as she shakes the particular object harder, her vocalization also becomes louder. A few other episodes show a higher intensity response, where her vocal sounds become shouts or high-pitched screams. The following episode is one example.

Episode 20, Parent Diary, April 1, 11 a.m:

Where: With Dad, at home

Devynn was playing on the floor, there is a toy that she loves to put in her mouth and chew. While she was doing that she picked up another toy, a rattle and started shaking it vigorously. She then took the toy out of her mouth and with toys in either hand started banging them together. She kept this up for about 5 seconds or so. Then she started doing it again, but this time she started shouting and kicking her feet.

It seems that upon hearing her sound output, Devynn responds by kicking her feet which intensifies the sound output of the instrument/object. Her accompanied vocal sounds match the dynamic of the output, as well as possibly indicate her emotion from hearing these sounds.

Music-making with others. There were episodes that described how singing a song to Devynn would relax and soothe her. Devynn's mother has put on music and danced while holding her to soothe her, and Devynn seemed to enjoy this. In one diary entry, Devynn's dad was about to put her down for a nap. When she became cranky, he played some music and she responded by bouncing up and down. When he stopped the music, "she wasn't happy, so I sat her on my lap, turned it back on, and she calmed down again. She raised both arms towards the phone [the sound source], looked at me and smiled and started bouncing up and down on my lap" (Episode 26). Listening to music in these instances paused her distress and led to musical interactions. The following episode depicts Devynn interacting through movement and gesture with a grandparent:

Episode 21, Parent Diary, April 2:

Where: With Mum, Grandparent, at home

Granny was sitting in the couch and Devynn was sitting on the floor. Granny started clapping her hands and saying the rhyme 'clap handies'. Devynn watched her intently and when she finished she started bouncing as if to say 'again'. So

granny did it again and at the 'clap handies' part I brought Devynn's hands together and showed her how to clap. She was smiling and looking intently at granny the whole time.

Later that day Devynn was sitting on the floor and looked at granny and did a very purposeful clapping movement (2 claps) and when granny responded with delight Devynn repeated it and granny sang the rhyme again while Devynn clapped.

In the first part of this entry, it seems as if Devynn was learning the rhyme and the clapping, focusing on the grandparent. Her clapping later that day suggests that she associated the rhyme with her grandparent, and in doing so requested the rhyme by clapping her hands. The grandparent's immediate response led to their musical engagement.

Devynn's mom also plays the shakers with her -- they each have a shaker and they play them together. One episode where she initiated music with Devynn related to a Life Cubby memo she received from the infant room. At school, a teacher tapped the floor and Devynn tapped with her. Devynn's mother expressed how she tried to do that activity with her daughter the night before. As she told me about this, she demonstrated by tapping the carpet, and Devynn tapped back. During the interview, Devynn's mother talked about how they use objects to bang together, including measuring cups, Tupperware containers and mini disposable bottles that they received from the hospital. It was Devynn's father's idea to keep them so that Devynn could play with them. The following episode describes Devynn initiating a musical moment:

Episode 18, Parent Diary, March 7, afternoon:

Who: Mum

Where: In the living room at home

I was holding [Devynn] in my arms as I bent down to the toy box to get her something to play with. I gave her one of those plastic measuring cups in her left hand and I had one in my right hand and as I bent down to the toy box they hit off each other accidentally. [Devynn] stopped and looked and smiled and then she actively moved her hand towards the one in my hand and started tapping on it. After doing this two or three times, I put her on the ground and she lay on her back looking at the plastic cups and having them against each other for another couple of goes before she moved on to something else. I had barely noticed that the two cups had hit off each other so I was surprised that [Devynn] had even noticed or that it was significant for her.

This moment seemed to be a surprise for Devynn's mom, suggesting that Devynn's hearing is focused and acute. Hearing the cups slightly tap together propelled her to initiate musical play with her mother.

Teachers' Lens: Musical Devynn at School

At school, Devynn engaged in all behaviors, with instrumental play and vocal being the most prevalent. The most common functions include communication, comforting/entertaining self, and undetermined.

Actively seeking music. Towards the beginning of the study, teachers reported that Devynn liked to hold objects and shake them. HT1 reported that Devynn likes to play and mouth the variety of objects they have in a basket of toys, which include different shakers. She also responds to her own created sounds. HT2 describes Devynn playing her shakers to different tempi:

She does the shakers, she definitely responds to her shaking. She shakes vigorously and then she shakes slowly. She'll roll over and like roll over on something that makes noise and she's like, what was that? And then she'll try to look for it. I haven't heard her try to respond--She definitely likes the Peek-a-boo songs. (HT2)

At home, Devynn's vocal sounds matched the dynamic of her instrument play. This episode did not report vocal sounds accompanying this scene, however, it does portray

Devynn discovering sounds and seeking the sound source. By the end of the study, Devynn's instrumental play expanded as did her mobility. HT1 and HT2 describe how her behaviors have changed over the course of the study:

She's been playing a lot with the shakers, the bells and the castanets...I'm not sure what I said last time that she was doing a lot of, but now that she's crawling around, she really seeks those out...Earlier today just like two hours ago maybe after she woke up from her nap she was playing with an egg shaker. I don't think she did it purposefully, but it flung out of her hand and then she went to go chase after it, to crawl after it. So, it's objects that she's definitely interested in. (HT1)

Now that she's mobile she's like- If a book was read, whether it be a songbook or whatever she was military crawling herself over there... She's got that one arm, I don't know. She's so- super strength. She's paying attention to it. (HT2)

HT2 described different instruments, other than shakers, that Devynn plays and her determination to go after those sound-makers. In HT2's excerpt, Devynn also goes after the sound-maker with the intensity of her crawling, indicating her determination to be with music. This seems similar to how Devynn seeks out sound sources at home and actively moves to them in order to participate with others and be part of that music.

Music-making alone and with others. Along with teachers singing to Devynn to soothe her, GA2 reported that, "Devynn will use her own type of music and cooing sounds that will calm her down." Teachers also reported that Devynn was beginning to babble at the beginning of the study. HT2 described Devynn being at the snack table by herself and babbling. While she could not determine whether her babble was musical, she described it as rhythmic. This is similar to her parents reporting Devynn's vocal repetitive chanting as a rhythmic pattern. Another instance of solitary vocalization attracts another infant in the classroom. HT2 describes a memory of Devynn initiating music, and Frederic interpreting her actions as possibly musically related:

I think Devynn is choosing to cover her face...it's advertently-- like she's rolling around with the blanket and she's covering her face accidentally, like she doesn't mean to do it. But there's other times you see her and she's pulling up the blanket and that she's bringing it down and she's giggling and she's by herself. And I think the giggling, the older kids respond to it, so then Frederic then came over and handed her a shaker. I don't know if it was a different thing. She didn't take it, but he laid it next to her and then he walked off. She stopped putting the blanket up over her head and grabbed the shaker and was shaking it and making the noises. (HT2)

It was hard for HT2 to discern whether Devynn was playing peek-a-boo with herself.

During music class, we sometimes sing a song that involves scarves and peek-a-boo gestures. Devynn did not have music class with me until the study began, due to her not being around during music time the previous term. Therefore, I could not imagine she was reenacting the scarf song from music class. However, HT2 did mention that Devynn might have seen Ashlee do similar motions in the classroom, possibly the scarf song. It seems as if his interpretation of her behaviors were somehow related to music, as her giggling and actions seemed to propel Frederic to offer her a shaker.

GA2 also reported that Devynn was becoming more vocal in general. She described Devynn and her enjoyment in blowing raspberries. Devynn will engage in a raspberry exchange with a teacher while smiling. The teacher could be vocalizing the raspberry sound or talking to Devynn, and she will respond back with a raspberry. In one diary entry, the scarf song from music time was initiated by Lily, using a basket. As HT2 and Lily engaged in this activity, Frederic and Cyndi also became engaged bringing a scarf into the play. Devynn stopped mouthing an object and watched her peers, with their heads covered. When HT2 removed the scarves on the musical cue, and Lily, Frederic, and Cyndi shouted "boo!" Devynn made a squealing noise. When it was Devynn's turn and HT2 placed a scarf over her head, she babbled and moved her legs back and forth in

response. Upon removing the scarf, Devynn smiled and made a vocal raspberry sound. Although Devynn is the youngest of the group, HT2 felt that when Devynn was observing the activity, she seemed aware of, “what was going to happen when HT2 placed the scarf on her head.” In this scene, Devynn participated in the scarf song by babbling, blowing raspberries, and moving her legs.

Another episode that includes peer interactions begins with Lily again initiating the musical activity. She brings the book, *The Lady with the Alligator Purse*. The following episode comes from HT2’s diary entry and describes Devynn’s responses:

Episode 42, Teacher Diary, March 8:

Who: HT2, Lily, Devynn, Max & Frederic

Where: Infant room by the diaper bins

HT2 was sitting with Devynn since she was so close to the diaper baskets and several children were getting their diapers changed. As HT2 was playing peek-a-boo with a scarf with Devynn, Lily brought over *The Lady with the Alligator Purse*. Lily asked, “read book.” HT2 positioned the book so Devynn could see the book. HT2 started singing and soon Frederic and Max joined. Max started to babble as HT2 sang the song. Devynn rolled and got closer to the book trying to grab the pages. When HT2 read the part where Tiny Tim tried to swallow the tube she touched Frederic and Max’s throat. This made them giggle. Frederic signed ‘more’ for HT2 to keep reading. When HT2 finished reading the book Devynn rolled over and started to make her raspberry sounds. Lily asked for the book again and Devynn rolled back over closer to the book. Frederic touched his throat when we got to the part Tiny Tim swallowed the tube. Max bounced a little as he was holding onto HT2’s shoulders.

I [HT2] was not sure if Devynn was singing with her raspberries but how this play scene unfolded it definitely felt that her raspberries were her response to the book and HT2’s singing. Maybe she did not like my singing! This was my first time reading this book, I did not even know that it was in the room but the children seemed to know because Frederic came right over and sat waiting patiently for HT2 to sing.

At the time of the entry, Devynn generally rolled around the carpet to get to where she needed to go. In this scene, she rolled closer to the book and while her peers were

actively engaged in the song book, Devynn also responded to the musical play with her raspberries. It seems she is generally attracted to the sound source, and with the many musical responses around her, she contributes hers in her own way.

Researcher's Lens: Peeking into the Infant Room

During field observations, the most observed behaviors were vocal followed by instrumental play. Functions were spread between Comforting/entertaining self, communication, and exploration.

Music from the carpet. This study covers Devynn's musicality starting around 7 months of age. Aside from the snack table and changing table, I observed Devynn on the carpet most of the time in the infant room. Naturally, all of the infants spent time on the carpet, but I felt that since Devynn was the youngest of them all, most of the music behaviors I observed during play were of her on the carpet. When she is lying on her back, she produces vocal sounds like gurgling, pitched, "ah" sounds, "dah," "bah," hums, soft cries, slides (ascending/descending), and unvoiced raspberries, to name a few. At times her vocal sounds were accompanied by movement of her arms and legs waving about or hitting the floor. She also holds an object or two in her hand/both hands, like rattles, toys, and other objects that she taps together and mouths while moving and/or vocalizing.

She continues vocalizing sounds while rolling over on the carpet as well. There are a few baskets of objects including some musical instruments in the infant room. She rolls herself towards the baskets, reaches for it and pulls out various items, shakes and/or mouths them, keeping some items and tossing aside before reaching for another. Objects include orange colored bell shakers, wooden maracas, various sound makers, castanets,

scarves, and other toys. She makes her way around, exploring the various objects and pieces of furniture placed in the infant room.

A few episodes from the table portrayed Devynn tapping containers, bottles, and bowls on the table while making, “ah” sounds in her lower range and raspberries. One particular vocalization I noticed sounded similar to the sound of a voiceless throat clearing, which she did in between being fed. While it seems that these episodes were of Devynn vocalizing as solitary play, there was one episode where she seemed to be directing her sounds towards Max:

Episode 57, Researcher Report:

The practicum student picks up Devynn and puts her on the table to eat. In between being spoon-fed, Devynn makes, “ah dah dah dah,” as she reaches an arm towards Max. Max’s back is facing me...

As the practicum student is holding the water bottle to Devynn’s mouth, she pats the table, makes loud, “ahhhh!” sounds, and starts to make unvoiced lip trills and then chews on the nipple of the bottle and makes “ah” sounds, as she is chewing on it...

Devynn is now patting the table, with an, “ahhhhhh,” adding a little bounce, before being fed another spoonful of food.

In this episode, after she finished eating, she was taken to the carpet where she continued her vocalizing and played with plastic cubes. She hit the cubes on the floor creating a rhythmic pattern twice. She gestured towards Max. However, since I could not see Max’s face, I was not able to see his facial response. In the midst of Devynn’s vocal sounds and tapping, she bounced. During my observation, I wondered whether this particular bounce was an indication to the practicum teacher that she was ready for another portion of food.

Musical conversations. I observed Devynn making vocal sounds while on the diaper changing table. Along with her variety of sounds, I observed her put her hand over

her mouth, as she continued making soft sounds. Another observation reminded me of her parents' report of Devynn getting upset when music stopped. During this particular diaper changing, Devynn makes vocal exclamations, vocal complaints, and also joins in singing.

Episode 60, Researcher Report:

The teacher takes Devynn to the changing area. Devynn makes complaints; she is hitting her feet on the table as the teacher begins to start undressing her. Devynn continues to cry. HT2 just walked in and says to Devynn, "Why are you crying?" in a soft head voice. Music just came on, HT2 says to her, "I turned the music on." The music playing sounds like soothing tunes. Devynn continues to cry and makes forte and accented "da da da da!!" like she is complaining. The other practicum student comes over to help. She says to Devynn "a da da da" and Devynn is quiet. Then she says in a whisper "a gee gee gee" and "ch ch ch" ("a" is the pickup note to steady beats). One of the teachers is now singing *Itsy Bitsy and Wheels on the Bus*. Devynn is quiet, as she sings in a piano voice. She stops singing; Devynn cries loudly and vocalizes, "/aja aja aja/!!!" The teacher continues to sing another verse of *Wheels on the Bus* ("the baby on the bus goes wah wah wah, she makes gestures like crying). Then she sings, "Devynn on the bus goes..." and she claps as she sings. She does all this while facing her and being changed. They are done. The teacher walks away. Devynn makes another loud wail and the teacher is dressing her on the carpet. She thanks the other teacher for her help.

The teacher sits in front of Devynn and Ashlee. Ashlee has the broom; she holds it and makes sweeping motions. The teacher says "swish, swish, swish" and Devynn and Ashlee both watch her.

It seemed that music in the background was not enough for Devynn. Singing to her on the other hand seemed to engage Devynn along with applying Devynn's name in the song and facing her. Immediately after the teacher who sang walked away, Devynn resumed her crying, which stopped as fragments of the song continued into Devynn and Ashlee's play space.

There were episodes that exhibited duets between Devynn and an adult. While Devynn was lying on her stomach during one occasion, she and a teacher took turns

tapping on the wooden ramp. Devynn watched as the teacher tapped and she answered by tapping back. Another time, her mother came in to apply eye drops for Devynn. As she lay Devynn down on the pillow, Devynn initiates a vocal raspberry, her mother responds, and they continue doing this back and forth conversation a few times. Her mother's body was hunched over Devynn during this raspberry exchange. As her mother leaves, she props her up on a pillow and they make eye contact before she leaves the infant room.

The following episode opens with Devynn working with objects from the basket and moves into a musical exchange with a teacher.

Episode 54, Researcher Report:

Devynn rolls herself near the basket and grabs an object that makes a shaker sound; she is on her back and starts shaking it. She rolls onto her tummy and starts hitting the shaker onto the carpet. She reaches for the basket and starts to pull the basket of items towards her. She takes the mirror out. She pulls out the orange bell shaker followed by another orange bell shaker and puts that one in her mouth. From the tipped over basket, she pulls out a wooden noise maker, shakes it a few times before putting it down. The teacher takes a small green scarf and holds it up to her. Devynn looks at the scarf as she holds it up. Devynn makes an, "ah ah" sound. The teacher puts the scarf down; Devynn makes an, "ah-ah." The teacher waves the scarf up and down, and Devynn makes another similar sound as the teacher continues to pull the scarf up to her level, higher then very high. Devynn watches intently.

Devynn is on her back with the shaker object, and the teacher now holds a maraca and she plays after Devynn plays. They alternate and continue this musical conversation until she offers the shaker to Devynn. Devynn now has a shaker in each hand as she shakes them both.

What starts out as Devynn going through various objects on the carpet turns into a call/response of Devynn's vocal sounds and the silent scarf. She is focused on the object and the teacher's actions, timing her vocals in between the motions. The turn taking continues with instrument play, during which time, the teacher waits for Devynn to make the first sound before she enters into the call/response.

The Music Teacher's Lens: Group Music

During this study, Devynn and I worked together for the first time during music class, unlike the other children, with whom I was previously familiar. In the previous term, she was not in the infant room at the time music class was taking place, as she was usually asleep. Her most prevalent behaviors in music class are movement and instrument play. The most prevalent observed function was for communication.

Dancing in the infant community. I usually start the opening segment of music class by playing various songs from my iPhone. Whether Devynn is on the carpet or in a teacher's arms, she actively participates at this time by moving to music with her peers and teachers. During our first music class together, Devynn is on the carpet changing positions from being on her back to rolling onto her stomach. I interact with her a few times in between dancing with other infants.

Episode 61, Researcher Report:

I start the music and snap my fingers as I look around (“It Don’t Mean a Thing”). I approach Devynn while she is on her back and “dance” with her, at one point tapping her feet together (my first interaction with her ever)... Devynn is on her tummy now as she looks over to me, and I invite Frederic to dance with me... Devynn makes a vocal sound and rolls over onto her back in front of me. I peer down at her with Frederic in my arms, as we move and dance downwards towards her, and Devynn, after observing us, moves her arms and feet...Devynn is on her side now, continuing to make sounds as she rolls over...I make gestures to Devynn while she is on her back; her arms are raised towards me and at some point we look like we are mirroring each other (Waltz No. 3, A. Beach). She allows me to pick her up. The song ends, and we change the music to “Shake it Off” (from the movie *Sing*)—it’s an upbeat song.

I was prepared to approach Devynn slowly since it was her first music class with me, and the group. However, she allowed me to be with her and responded to my gestures while the music was playing. During the waltz, it felt like we were having a musical conversation of gestures; I was not sure who was leading the gestures.

During another music class, “Shakey shake shake” was playing in the background while Devynn was lying on her back with an object in hand. A few of the teachers including myself were holding babies and dancing around her. Devynn vocalizes and waves her arms and legs. It seems that being able to see us around her invited her to move with us, even from her positioning. During our last music class of the study, Devynn had just finished eating when the teacher brought her to the group to dance. Facing the dancing group, Devynn immediately starts shaking her arms and legs. Moments later, we played “All About That Bass” for Max. As I interact with Max, the camera swings over to the group; Lily and Devynn are swinging their arms up in the air while being held by teachers, and Ashlee (doll in hand) smiles at them. Devynn continues to move her arms and legs within the group to the music.

At that moment, we had a nice laugh at the sight of the group dancing, almost as if it was unbelievable that these infants can express themselves in this way while listening to that particular song. The group dynamic of infants expressing themselves individually within the collective is such a powerful sight to see and feel in that moment. The laughter felt like a mixture of surprise, delight, acknowledgment, and respect.

Impetus from music. Devynn indicates her preferences during music. During one episode (65), I offer choices of books. Cyndi chooses the Twinkle, Twinkle book. As I sing the song, I offer it to the infants one-by-one so that they can have a closer look and to touch it, should they feel the need. Devynn has her eye on the book and reaches towards it as I pass it around. When it comes towards her, she taps the book with her hands. I offer it to Frederic, he taps it with shakers, and as I continue singing Lily is playing the tiger piano, as if in accompaniment. During this song, Devynn makes vocal

complaints when the book is not near her, and when the book is offered to her, her complaint stops. In another episode (69), we are singing the hello song with the hand mirror. She vocalizes while we sing the song. After Lily had her turn, I try to determine the next child to hand the mirror; Devynn had been vocalizing and reaching for the mirror. When she has the mirror, she shakes it and makes vocal sounds at the same time. When the song ended, she looked at me and moved the mirror as if the mirror is dancing. These instances show how through Devynn's own agency, she makes her preferences and requests known through her movements and vocalizations.

Devynn looks to others as well. During one episode (70), Devynn is sitting next to Ashlee. Both have shakers in their hands. As Ashlee waves and shakes her shakers, Devynn looks at her and immediately begins to shake her instruments. Towards the end of the song "All About that Bass" (episode 76), Devynn is sitting on the carpet across from a teacher. The teacher dances with her on the floor by gesturing to the music, making physical contact with Devynn, and tapping the carpet with her hands to the beat of the music. Devynn observes her and her infant community dancing around her and patsches her thighs in response to the teacher's tapping. Moments later, after the teacher clapped her hands to the beat, Devynn followed suit while still observing others around her.

While singing the extended version of "Row Your Boat" (episode 79), Devynn looks at the book with the group. As a teacher starts to clap to the beat of the music, Devynn does the same and then patsches her thighs. She then moves towards the orange bell shaker, touches Ashlee's back, and plays the shaker during the song. By interacting with others' musical ideas, Devynn takes on some of the musical behaviors and is able to

add to them. I have noticed that Devynn interacts with Ashlee during my field observations and music class observations. These moments happen so quickly; observing these musical moments in the infant community can be hard to detect with many musical ideas happening simultaneously. However, capturing them on video offers an insight into how young infants make music.

Moments of surprise were also captured during music class. We sing a goodbye song at the end of music, applying each infant's name into the song. During one music class (episode 75), Devynn was lying on her back, focused on the instrument in her hands when I sang her name in the goodbye song. In response, she moves her arms and legs and looks in my direction. The fact that Devynn responded to her goodbye song without giving prior indication of her awareness surprised me. Other moments of surprise involve the shakers. She seems to enjoy playing with the shakers with her peers. During one class (episode 78), Devynn makes a vocal sound of excitement when she attains two shakers, while lying on her stomach. During the shaker songs, she watches others and participates; at times, she will start the play before others, and I will follow her lead. There was one instance when I brought out the shakers when Devynn was sitting on GA1's lap. As her peers gathered around the basket, Devynn leapt out of GA1's lap and was on her stomach claiming shakers for herself; she made an elongated sound. Later, as we sang Twinkle, Twinkle, infants were shaking and singing fragments, when Devynn all of a sudden made a loud, elongated vocal sound while simultaneously shaking her shakers. Her vocalizations here seem to indicate her excitement and pleasure during this activity.

Parents and teachers have reported Devynn doing the "army/military" crawl towards an object. I have seen this in my field observations. It is the penultimate music

class of the study, and I bring out the basket of shakers and place them on the carpet within the circle of infants and adults. Devynn is lying on a towel on her stomach in the floored area of the room. Upon seeing the basket of shakers, Devynn pulls herself, making her way rapidly towards the shakers. When she reaches them, she gives a loud vocal sound of excitement and kicks her legs on the carpet, as she grabs a shaker and begins playing. She is smiling and shaking. Moments later, she makes an even longer vocal sound as she kicks her legs. Having reached the shakers, Devynn seems to be expressing her victory through her vocal and movement behaviors.

Summary of Devynn

At home, Devynn engages in playing or movement behaviors that are accompanied by vocalizations. The nature of her repetitive behaviors creates musical patterns that sound musical and seem to provide a sense of comfort and entertainment when she is alone. Devynn's responses to sounds are gestural and movement-based. These sounds attract her attention, leading her to seek them out in order to interact with the music and others. In exploring her own created sounds, Devynn's vocal responses seem to muster a higher intensity and dynamic, as an emotional response to her sound-making experience. Singing or playing music to Devynn can calm her when she is distressed and also lead to musical interactions with her parents. Devynn also initiates musical play by doing the behavior first, as a way to engage and communicate musically with others.

At school, Devynn explores various instruments available to her in the infant room. Her repertoire of playing instruments expanded as the study progressed. In discovering sounds that she creates, she strives to repeat those sounds and actively moves

towards them in order to make music on her own, or to join others in the music making taking place. Devynn vocalizes alone possibly to comfort or entertain herself. She also vocalizes with others, participating in one-to-one call and response type vocalizations using raspberries. During peer music activities that take place during play, she observes and is aware of her surroundings and responds musically, as she is part of the music taking place within her peer group.

During field observations, Devynn explored a variety of sounds while vocalizing. She did this during play, at the snack and changing tables, and at times, these vocalizations accompanied movements and instrument play. Teachers singing and making eye contact with Devynn during diaper changing seemed to calm her. Devynn engages with her teachers and her mother during turn-taking activities that involve vocal and instrument play. In the case of her mother visiting the infant room, the intimacy through eye contact and body posture seems to portray an intimate moment of bonding. Turn-taking activities include vocalizations, objects, and instrument play, where Devynn and her partner are focused, as they time their musical conversation. During music class, Devynn participates within the group dancing, individually expressing her musicality while communicating within the group. By vocalizing and moving, she is able to express her preferences during music. Through others, she receives musical ideas and makes them her own, as she interacts musically with a partner and within the group. Devynn is self-motivated in making her requests and responds to song cues and musical objects, as they seemingly provide impetus for her music making. In doing so, she expresses her emotions, as she joins in music making with the infant community.

VI – DISCUSSION OF FINDINGS

Introduction

The purpose of this study was to explore and understand the function of music in a community of infants. In Chapters IV and V, I presented portraits of seven infants, telling stories of their musical lives, as seen through the lenses of parents, teachers, researcher, and music teacher. As the researcher, I gained insight into their daily play in the infant room, keeping in mind what parents and teachers reported from interviews and diary entries. As the music teacher, I caught a glimpse of how their behaviors were highlighted within the structure of music class, while allowing for emerging interests from the infants to take precedence. Seeing how behaviors were exemplified or minimized in the context of music class in tandem with or in contrast to other settings provided insight into understanding how a musical class community might bring out different facets of infants' musical behaviors, and perhaps how music might function differently for them in this setting.

In this chapter, I highlight themes that arose through my findings by presenting an analysis of the infants taking into consideration the two age groups presented in the portrait chapters. As I present the analysis of the infant groups within each setting, I revisit the research questions.

1. What are the ways in which infants are musical?
 - (a) What behaviors are considered vocal?
 - (b) What behaviors are considered movement?

2. What do parents and teachers report about infants by observing their music making?

- (a) What do parents report regarding musical behaviors in the home?
- (b) What do teachers report regarding musical behaviors during music time and outside of music time?
- (c) How do the musical behaviors of infants vary depending on whom they are with?

3. What function(s) do the musical behaviors serve?

As stated in Chapter IV, vocal and movement behaviors were the most prominent behaviors identified overall. From the viewpoint of each setting the following behaviors were the most prevalent: listening and movement at home; vocal at school; vocal from field observations; movement from music time. The findings in chapters IV-V confirm that (a) each infant is unique, and their musical behaviors reflect their individuality, (b) infants require and demonstrate agency in their music making, (c) the infant community I viewed utilizes parts of the environment to create musical spaces that encourage social engagement, and (d) an infant-centered environment driven by an emergent curriculum creates a sense of busy-ness, as simultaneous conversations (musical/nonmusical) and activities are going on between each teacher and her focus child. Following this analysis, I present a discussion of the behaviors observed, the possible functions of musical behaviors, and the social nature of infants with adults and with their peers.

Musical Behaviors in Various Settings

As I described through the individual portraits, each and every infant had particular ways of exhibiting their musical behaviors. No two children are alike in their musical personalities, and it is through individual preference and choice that they engage in music behavior. While there might be factors that influence music interactions such as culture, ethnicity, and language, all babies in this study seek out and respond to music. At home, babies seem to have frequently engaged in listening and movement behaviors. For the older group, listening was the most prevalent, with movement and vocal following evenly in second place. For the younger group, behaviors were based more around movement and instrument play. At school, vocal behaviors took top place followed by an even split between movement and instrument play. Both infant groups exhibited a high number of vocal behaviors; field observations confirmed vocal behaviors as prevalent for both groups at school. In slight contrast, music class brought out more movement behaviors in both groups.

Home View

While the overall most frequent behaviors in each setting were identified, each behavior had a place in each infant's musical life. The older group having a large number of listening behaviors could be attributed to the fact that Cyndi, described as being a very aware listener, was reported listening to music on the stereo, her Firebunny, and her interactive book. At the time of the study, Cyndi received the interactive book as a gift and spent a large amount of time exploring the different songs it had to offer. Listening to the stereo and the Firebunny seemed to take place frequently at home, and her parents,

likewise, reported these instances through their diary entries (41); they submitted the highest number of diary entries of all participants. In fact, Cyndi had the highest number of home episodes of all infants.

Table 8

Behaviors by Child: Home

	Home						
	C	F	L	B	M	A	D
V	5	5	21	5	5	5	12
M	13	6	11	6	18	17	12
IP	11	4	7	6	20	12	12
L	37	7	7	3	8	13	13
Total	66	22	46	20	51	47	49

Note. V=Vocal; M=Movement; IP=Instrument Play; L=Listening. Infants are identified by their first initial.

In this group, two out of four parents submitted diary entries, providing a view that leans towards the children with more data from which to extract episodes. Movement and vocal behaviors in the older group were clearly seen through scenes such as those that described the active nature of Frederic dancing with his parents and sibling, Cyndi's dance moments with her mother while listening to Beethoven, the morning dance ritual of Lily and her mother, and Benny's family time where he engaged in dance with his sister.

Lily exhibited a high number of vocal behaviors which amounted to more than half of the total behaviors at home of all infants.

The younger infant group exhibited movement and instrumental play as the prominent behaviors in the home setting. Here this seems fitting since Max, Ashlee, and Devynn all exhibited playing musical instruments or objects, as well as moving in response to sounds. Interested in sounds and sound-makers, babies during their first year of life are attentive listeners pursuing how to physically make sounds (Young, 2003), and sounds in the environment along with moving and playing form the basis of musical development (Littleton, 2002). Max's reports from home showed a lot of testing of sounds through his discovery of playing objects together. Ashlee frequented the keyboard at home often and danced to it. Devynn's episodes indicated that she often had an object in hand, while vocalizing and moving simultaneously. All parents in the younger age group submitted diary entries.

During the parent interviews, I asked whether parents watched music DVDs or programs together with their children. Six out of seven families reported some form of programming that included sports, Saturday morning T.V. shows, cartoons, YouTube videos of music performances or videos geared for young children. While data did not indicate the frequency or consistency of screen time, it could be a possible reason for more moving/listening behaviors in the home setting. There might also be various interpretations of what singing might sound like to others. Infants tend to musically babble, sing fragments, particular words, and for the younger group, different vocalizations such as generic sounds with not very definable syllables, intervals, or glissandi might not necessarily sound like song to some listeners. As I did not provide a

behaviors guide for the participants, there might have been under-reported vocalizations. One other factor to consider is that there are more people for babies to imitate in the school setting; this could well be a reason why there were fewer vocal behaviors reported from home in comparison.

Listening: Music captivates and comforts. Many parents reported that singing or playing music to their child had a soothing effect. In the way that Cyndi and Frederic's parents described their response to music, it was as if music captivated their attention. Cyndi's facial expression for example upon listening to Chinese opera and Frederic's response to the musician in the park present moments where it seems like time stands still for them. In Frederic's case, his father described music having such an effect on Frederic that he was not his usual active self. Babies in their second year of life can listen for a long period of time with their gaze fixed on the musical source. They can remain very still and focused on the music source for some time, especially during a performance (Young, 2003). Lily had similar responses when in distress. Upon holding her close and singing to Lily, she immediately became quiet, and her distress seemed to dissipate instantaneously. Music for these infants in the older age group seemed to be a trigger that "mesmerized" them, which was the term Frederic's father used for his son's response. Nevertheless, music also soothed Frederic and Cyndi in distress, as it did for Lily. Just as Frederic's father would sing and bounce Frederic to calm him, Cyndi's mother sang in Chinese at bedtime. In addition to soothing, there seemed to be a closeness or intimacy that Cyndi felt toward her parents, as she called out "mama" and "dada" softly during the shared musical moment. These musical moments seem to reflect a type of musical parenting described in Ilari's (2009) study where parents are attentive to their child's

needs, bonding with the child while soothing them, and in the process helping to create a secure environment and sense of belonging.

In the younger group, Max, Ashlee, and Devynn's parents also reported music having a calming effect. For Max, he gestured to his mother during bedtime in order to request songs and moved his body when requesting a song on his playlist. Devynn, also calmed by music, responded with movement, interacting with the sound. As in Max's case, while music might have a calming effect, it also allowed for interaction between the parent and the infant. For Ashlee, being calmed in the subway train, during swim class, or from her mother's singing/ spontaneous humming while in the rocker was also portrayed as having an immediate effect. Aside from the comfort that Ashlee received, she bonded with her father to music and to being moved. The one episode where they engaged in this bedtime routine while making eye contact suggests an understanding between the two within the shared closeness. This nonverbal exchange suggests the intersubjective nature through shared emotional states especially as emotions are expressed from the eyes; mutuality is fundamental for human development (Dissanayake, 2000b; Miall & Dissanayake, 2003). In all infants, the sense of closeness in these dyadic interactions or the act of satisfying their requests for song seemed to indicate parents being attuned to their babies (Bornstein & Tamis-LeMonda, 2014).

Moving: Music to connect. In all infants, movement can include gesturing as a way of making requests. In Devynn's scene with her grandparent, her act of clapping later in the day after learning the "Clap Handies" delighted her grandparent to engage in the rhyme. Max's similar clapping delighted his father who recognized the Israeli clapping song and realized that Max might possibly have been singing the song in his

head. The younger group appears to use gesture in order to musically communicate with those family members who taught them the song. Adults using chant with body movements like bouncing or clapping invite infants to join them, as they are able to learn these types of rhymes and play songs quickly (Trevvarthen, 2000). These types of interactions provide a way for babies to experience the pace and structure of musical play, while engaging with adults, thus setting up a framework for sharing and communication, as well as supporting motor coordination (Tafari et al., 2008; Young 2003). Devynn and Max's musical invitations were enthusiastically received, which contributed to their music making. Moving or dancing can also be part of participating in family moments, bonding the infant and parent.

Cyndi often initiated dance with her mother while listening to Beethoven's symphony. In her case, initiating music was important for Cyndi, and in doing so, she appears to be a musical agent taking part in making meaning of these musical experiences. She invited both her parents at different times to move with her to music that she selected. Cyndi's laughter and smiles indicate the emotion she experienced when musically engaged with her parents, experiencing the sense of safety and warmth while recognizing what is meaningful as biologically important (Dissanayake, 2000b). Frederic engaged in songs from his culture with his parents, in particular, a German action song. These songs fit Frederic's active nature, but at the same time he is exposed to music that maintains and connects to his culture. Special moments with Lily and her mother took place during their dance rituals. One video displayed such joy and emotion; it was difficult not to feel the impact that the music and interaction with her mother had on Lily. In this episode, Lily's sibling video recorded the moment. This indicates that there were

times when her sister was part of this ritual. Other episodes not included in Lily's portrait showed Lily and her sibling dancing and singing together. Benny and his sister have a very close relationship. His sister's enthusiasm for dance invites Benny into her play. Dancing here seems to connect him to his sibling. Interacting musically in these ways seems to encourage bonding between infant and adult (and their siblings), and at the same time promote future social development (Custodero & Johnson-Greene, 2008; Trainor & Hannon, 2013). For the younger group, they engage in movement behaviors by being held and moved by their parents, and these movements influence their musical perception.

Moving: Creating and responding. While the younger group engaged in dance by being moved, they also moved to their own self-created music. Similarly to how Cyndi played her interactive book and danced to the musical output, and to how Frederic set up his own karaoke musical space to sing and dance, the younger group listened to sounds that they created and moved in response to them. For Max, hearing the sounds of the large Lego blocks bang together initiated faster and more intense movements when kicking his legs. The sounds from the police car and the folding chairs also propelled him to move to the sounds he heard. Ashlee often created music at the keyboard. By pressing a button for one of the pre-recorded beats, she showed pride in her dancing. Devynn's response to hitting objects together while repetitively rolling around on her back and on her front-side seemed to be connected as one musical unit. These infants seem to be listening intently and responding to their own sound-making. Infants are highly interested in sounds and timbres and the physical actions that are required to make them (Young, 2003). There is also a sense of multimodality in their behaviors as they combine

movement, singing, and making sounds with objects (Marsh & Young, 2006). In these instances, infants actively create music and respond to them, and as musical initiators and innovators, they are developing their musical agency.

Musical preferences and choice. Three infants in the older infant group exerted their independence in the home setting by initiating and by requesting musical activities. By setting up the keyboard or the karaoke machine, Frederic demonstrated that he knows what he wants, and takes the steps to set up his musical space before responding to his own music by playing, dancing, or singing. It seems he did not ask for assistance. The description of the episode possibly alludes to one of solitary play, where Frederic engaged in private musical moments without adult interruption, thus allowing space for continued musical expression. In her research, Custodero encountered cases where there was a pause in spontaneous music making when children are acknowledged or interrupted by adults (Custodero, 2009; Custodero et al. 2016). Even with the keyboard unplugged, Frederic plugged it in and began playing. The tone of this part of the interview was strong, as if Frederic's purposeful behavior illuminates his ownership in music-making.

Cyndi very often requested music by gesturing to the object of her desire or by becoming upset during her bedtime moments with her mother, indicating that she wanted to hear certain songs. In the case of the interactive book providing the music, she chose the songs for her father to sing and to dance to with Cyndi in front of the mirror. While Cyndi's episodes indicate that she spent a long time listening to music on her own, it seemed it was important for her to have this time on her own and to be able to exert her independence by expressing her musical choices to her parents.

One way for Lily to let her parents know if they understood her musical requests was by moving her body in what her parents called her “happy dance.” Lily’s enthusiastic response was what her father described as an emotional response to “being understood and realizing that you’re going to do something as result of that communication that she has had.” Her response indicating that she knows her needs will be met seemed to let Lily know that her choice or request of music matters. These infants seek out music, and by being afforded the space to make their choices and to initiate their own musical behaviors, they are exhibiting agency in their music making. Through requests, they are able to drive their own learning according to what they need (Marsh & Young, 2006) in order to carry out their own musical ideas with fortitude.

Musical perception. At home parents seemed to be musically surprised by their children’s behaviors. Cyndi’s data painted a picture of her listening to music. At times music was in the background, while she was playing. Her parents were surprised during one episode when she requested music, as it had stopped. Her parents did not realize she was aware. Babies are able to detect changes in music from early infancy (Trehub, 2001), and they are very interested in sound and sound sources (Young, 2003). From the parent data, it seems that Cyndi listened to music in the background frequently, and she did not seem to lose any auditory acuity. Frederic singing the Darth Vader theme also surprised his father. On the one hand he knew Frederic could pick up songs; on the other hand, in that moment it seemed to catch him off guard. Tafuri et al. (2008) found that by 18 months, infants can sing phrases in tune. Lily sings along to songs with wordy and rapid text, trying to keep up with the song. Her effort and will display her determination for singing, and musical skill. Benny’s idea of turning the tambourine into a drum or dancing

during a break in the music, as I showed his parents the video during music class at the interview, seemed to delight his parents, as his response to music was not as overtly displayed as his sister's behaviors. Max making music instruments out of K-cups and other household objects shows his exploratory nature towards sound and how he applies it by creating new types of sounds, again interpreting the diary entries as amazing moments for proud parents to witness. Ashlee shared songs she learned with her father. He was delighted at her music-making, and at the same time she was sharing a piece of her music with her parents. The acute hearing of Devynn, as she heard the measure cups tap together, propelled her to initiate musical play (with cups) with her mother, also surprising her mother. These examples show that babies are musical; yet these seem to be amazing moments that parents notice. Even though I have seen how infants respond so readily to music, I am still in awe and pleasantly surprised by their musical abilities.

School View – Vocal: Music to Enact their world.

Data reported from teachers showed a high number of vocal behaviors followed by a somewhat even split between movement and instrument play. The older group having a large number of vocal behaviors could be attributed to Frederic's frequent solitary singing, as well as his engagement in singing during diaper changes, Lily's singing as requests to teachers, as well as her song initiations through singing, and Benny's consistent and unique variety of vocalizations during naptime and throughout his play. The younger infant group also exhibited vocalizations as the prominent behaviors at school. Ashlee exhibited a range of unique sounds while babbling throughout her play, and Devynn vocalized frequently when she was alone, accompanying her movements or instrument play.

Table 9

Behaviors by Child: School

	School						
	C	F	L	B	M	A	D
V	2	17	12	13	5	8	6
M	5	12	11	1	4	6	3
IP	1	6	2	5	5	2	7
L	8	6	6	7	6	6	4
Total	16	41	31	26	20	22	20

Note. V=Vocal; M=Movement; IP=Instrument Play; L=Listening. Infants are identified by their first initial

Lily and Frederic made requests for music through their singing and their gestures/movements. They also sang during solitary play. There were instances where Lily began singing songs, like “Row Your Boat” while reenacting boat scenes or while singing “Baa Baa Black Sheep” to her doll. By *doing* the boat scene and in comforting her doll, she put the song and play into a context of learning about people and the roles they play. Babies seek and respond to their attentive caregiver with joyful imitation, as here, where Lily becomes the caregiver to her doll. In learning about the world and their culture, babies actively move or take on the intention of others. Trevarthen and Bjorkvold (2016) confirm that human beings rely on their innate intersubjectivity of sympathetic imagination to enact their world.

Occurring in a non-organized or structured environment, these self-initiated play moments took place through their everyday activities. These playful interactions provided entry points into the social and physical worlds around them, as we learn what is meaningful for them while they gain competency through their actions (Marsh & Young, 2006). For example, Frederic requested song books from teachers and took matters into his own hands by singing “Twinkle, Twinkle” and other fragments while looking at a picture book. The comfort that Lily provided her doll, and the comfort Frederic derived from his own singing both led to their exploring the world around them. Benny, whose vocalizations were vast and numerous, also learned about how the world works through his exploration of sound. By discovering a new type of sound made with pop beads, he attracted his peers to join him. This discovery formed a musical ensemble. His crib sounds also turned into musical conversation and spontaneous song with Frederic in the nap room. Furthermore, Benny joined his peers in listening to songbooks in order to be with them.

Frederic initiating song during diaper changes might have provided a sense of comfort, as he and the caregiver engaged in song, at times a duet. The ebb and flow of this exchange with teachers is reminiscent of the call and response nature of music, learning the art of language by conversing with others within the contours of musical line. Adessi (2009) studied the daily routines of young children, describing the, “cyclical repetition of daily events” (p. 748) as a way to establish relationships with others through music-making that naturally occurs. These moments allow for variation and change to take place as partners engage in a musical structure of turn-taking, while experiencing music elements such as rhythm, timing, shape, and intensity (Papousek, M.,

1996). In the context of the older infant group, the musical songs whether solo or in duet (with object or peers), and in ensemble, led to a way of working out how things work in the world; they also experienced how to be in the world with others. In these instances, relating to one another prepares them to learn about the social world around them through their musical play (Ilari, 2016). The younger group also expressed vocal behaviors in learning about the world and connecting with others. Max's, "bah bah" musical conversation with GA1 displayed a turn-taking nature, with Max as the initiator. Ashlee was also part of the pop bead ensemble, engaging with her older peers while exploring and making sounds with the object. This joint attention on their shared playing of the pop beads led towards an understanding of others, including their emotions and intentions (Recchia & Shin, 2012). These infants, above the age of 9 months, are becoming more aware of others and their intentions, as they develop their understanding of others (Goodman & Tomasello, 2008). Based on evidence that infants can engage in group mentality while sharing an intersubjective space, Bradley (2009) studied the interactions of infants 6-9 months old in trios concluding that there is a relationship between music-making and attraction to making sounds.

While vocalizing alone possibly helps to develop sounds for basic musical behavior (Shimada, 2012), engaging in musical behaviors with others encourages prosocial behaviors. Ashlee's singing while swinging episode also depicted the nature of musical line and how she fit her vocals and gestures within the contour of her swinging, indicating a structure and form through her movements. Devynn, the youngest, was also described as making her own type of coo sounds to self-comfort. As her vocalizations grew, she engaged in turn-taking conversations using lip trills with teachers, developing

the sharing of emotions with others, as an antecedent to shared intentionality (Goodman & Tomasello, 2008). In vocalizing her lip trills during the group ensemble of *The Lady with the Alligator Purse* or the “Peek-a-boo” scarf song, she became part of the group, interacting within those musical spaces. These types of moments portray a sense of togetherness within music, as well as a sense of belonging within a childcare community setting. A shared understanding is again reflected as they communicate verbally and nonverbally within the space of the songbook (Niland, 2015).

Researcher’s View into the Classroom—Vocal: Musical Spaces.

Table 10

Behaviors by Child: Field Observations

	Field Observations						
	C	F	L	B	M	A	D
V	10	17	28	26	24	19	20
M	5	6	5	3	13	8	4
IP	2	6	6	14	9	11	14
L	1	2	2	6	0	9	2
Total	18	31	41	49	46	47	40

Note. V = Vocal; M = Movement; IP = Instrument Play; L = Listening. Infants are identified by their first initial.

My observations were conducted from the observation booth, in the infant room, and at times in the toddler room (when some infants spent time there), or the dance space. Out of 272 behaviors, 144 were identified as vocal behaviors. All infants in both groups

exhibited vocal as their most frequently identified behavior. I found this to be surprising since it was a high number and Cyndi, for example, who was described more for her listening and movement behaviors at home and at school also had a high number of vocal behaviors. I collected a substantial amount of data through field observations, reporting on all infants who were awake. I noticed Cyndi was absent the last two weeks of music class, as she had already left for the summer. The fact that I am a singer might be a possible explanation as to why my observations identified a large amount of vocal behaviors. However, I think a more likely contributing factor relates to how I perceive vocalizations that are musical due to the fact that my time spent with the infants allowed me to experience their many sounds. Field observations and music time served as sources to inform me on how to recognize their vocalizing as musical, as I had observed/heard a substantial amount of them.

During my observations, I noticed that there were a few specific places or objects within the infant room that sparked music-making. While vocal behaviors were not the only behaviors that showed up in these spaces, I will focus on those in this setting since the number of instances was so high. The permanent set-up of the infant room includes a low-level sink, a sink within a counter, a refrigerator, a table with high chairs and stools, and a diaper changing station. There are also two doors that lead to two nap rooms. Other pieces of furniture or objects in the infant room are added in and taken out according to infant interests and development. I noticed infants making music in the following areas or with the following objects: snack table, diaper changing station, nap rooms, trampoline, stability ball, square wooden platform resembling a conductor's platform,

large wooden rocker, trampoline, hand-held dustpan and broom, and baskets of various playthings, such as maracas and soft toys.

During diaper changes, singing can be initiated by infants, as illustrated during Lily's portrait, where she sang a descending sequence of intervals. She stopped singing once the changing was finished. During diaper changing, the child is usually engaged with a caregiver, seemingly a time to communicate, as teachers and infants are face-to-face, which provides for such opportunities. In these moments musical vocalizations can occur through imitation and turn-taking, possibly within a temporal framework (Addressi, 2009). Other infants who seem to vocalize often during diaper changes are Frederic, Ashlee, and Devynn. Popular songs like "Row Your Boat" also show up during diaper changes, as well as in other instances, for example, rocking in the rocker, or sitting in the platform (turned upside down) to reenact the actions of the song. These infants request or initiate music through their musical behaviors, and in doing so they are also showing ownership of their music-making. Lily sang while bouncing on the trampoline as she interacted with her peers (Benny and Ashlee). Max also vocalized while bouncing on the trampoline, as if his vocalizations accompanied his movements. The trampoline seems to naturally encourage movement (bounce), and younger infants, like Max and Ashlee, vocalized to their movements. Vocalizations in infants under 2 years emerged as spontaneous play where vocalizing with movement or movement of toys occurred (Young, 2003).

Benny and Cyndi placed their mouths on the stability ball, vocalizing to hear the sounds they were making while facing each other; a moment later Frederic rolled the ball away as he vocalized. GA2 chanted and bounced babies on this ball, giving each a turn,

including herself. GA2 provided musical experiences for the babies and herself. Benny and Cyndi seemed to be testing out the new sound on the ball, and Frederic sang while accompanying his motor activity of moving the ball. This seems to demonstrate infants using the object for their own purposes.

The snack table was a musical space where vocalizing was common. Infants vocalized with others, vocalized in between being fed a spoonful of food, vocalized with objects like using a bowl as a sounding board for their voice. Cyndi sang “all done” (in lieu of speaking in this instance), indicating she was ready to leave the table. During our interview, HT2 mentioned that snack time seemed to be a quieter time where music could be easily heard in the background, inviting infants to sing along or request songs, a pro-social environment. From my observations, gathering times – times spent together – seem to attract musical play.

The nap room invites explorations of sound or self-comfort during pre-sleep routines in instances where Benny and Cyndi were alone, or even with others. Addressi (2009) in her study described “autotelic” musical play for a particular child who vocalized in an interesting contour before closing her eyes, which seems to represent the singing alone I heard in the nap room. Sole’s (2016) study on toddlers 18-36 months suggests that pre-sleep vocalizations are a way to self-soothe, experiment vocally, develop and practice singing skill, reflect privately, and to understand people, events, or ideas and to transition from being together to being alone. In the case of Benny and Frederic vocalizing upon waking, they seemed to be communicating with each other first through vocal sounds that later turned into song. In exploring routines, Addressi (2009) analyzed the pre-sleep moments of infants 13-19 months in a group childcare setting and

found imitative vocal play among peers as they, “‘threw the sounds’ back and forth to one another” (p. 759).

Other objects like the hand-held broom/dustpan and the baskets of objects seemed to attract musical behaviors from infants. Max, Frederic, and Benny held or “played” the broom/dustpan while singing. Devynn often made her way toward the baskets of objects, pulling them out (including musical instruments) to play while vocalizing. As babies are attracted to sound and sound makers, baskets with sound making objects invite exploration (Young, 2003). Vocalizations accompanied movement and movement of toys, as the child showed interest in the sound output initiated by their movements.

Music Teacher’s View — Movement: Babies as Musical Initiators.

During music time, movement behaviors were identified as most prevalent, followed by instrumental play and vocal behaviors. All infants in both groups exhibited movement as their most frequently identified behavior. This is a contrast to the high number of vocal behaviors reported in the school and field observation data. One reason that could account for this result is that I sing often during music class. I sing through bouncing songs, “Hello” and “Goodbye” songs, songs during instrument exploration, songs with props like scarves, and with songbooks. I generally sing throughout the whole class (30 minutes) except for the opening movement/dance segment (5-7 minutes). I wondered if infants might not feel the need to sing if there is music in the background, which includes my singing. Custodero et al. (2016) found that there were instances when children’s spontaneous musical behaviors changed or stopped due to adult interaction. Young (2003) found that there was a decrease in children’s vocalizations during play when background music is playing.

Table 11

Behaviors by Child: Music Class

	Music Class						
	C	F	L	B	M	A	D
V	1	1	15	4	7	14	5
M	12	14	9	11	16	12	12
IP	9	8	8	9	7	1	9
L	1	0	0	0	0	0	0
Total	23	23	32	24	30	27	26

Note. V = Vocal; M = Movement; IP = Instrument Play; L = Listening. Infants are identified by their first initial.

While infants were free to roam the room during music time, the teachers and I generally gathered on the carpet with the infants after the opening dance segment. Infants generally sat on the laps of their teachers as we began with either bouncing songs or the hello song. As we moved on to other activities that included instrument exploration, some infants remained on their teachers' laps, and others sat on the carpet or moved around the room, flitting in and out of the group as they wished. Considering that some infants remained on the laps of their teachers for a long duration, they could be experiencing their teacher's movements to music, and responding without vocalization. While this may not be the case for all infants, it is possible that, if infants chose not to remain on their

teacher's lap and were moving around the room, there would be more instances of vocalization.

There is not much evidence of listening in music class. This is not to imply that no listening took place, as listening happens during other behaviors. Identifying listening meant that no other behaviors were apparent, as listening is present during vocal, movement, and instrument play behaviors. This then brings attention to how to identify listening. Listening seems to describe a scenario when an infant appears to be showing more attention to sound or that there is lack of other musical behaviors present. At home, listening was identified as the parent singing or playing music for their child. As listening was also identified with comfort at home, infants are listening to parents sing to them; the singing might not necessarily be initiated by the child. Movement on the other hand is a behavior that a child can initiate. Listening possibly describes the absence of initiated movement or vocalizing.

I find that infants will extend musical ideas from music time into their play. I have seen this extension during my field observations, for example, an infant initiating the scarf song with a teacher during play. I have also seen this immediately after music class has ended. After one music class, I left the infant room and stopped when I heard singing. I re-entered the room with my video camera and filmed Cyndi singing the "Goodbye" song to herself. This suggests delayed imitation and extension, and in this case resulted in vocalization. Custodero's study on observable indicators of *flow* experience in young children also found delayed imitation/extension in infants during music class. She described it as usually involving a musical activity that was previously done in class "which was reprised by a child's initiating behavior" (2005, p. 198).

In analyzing the various movement behaviors of all infants, I noticed that Benny and Max have at times participated on the periphery. Often, Max was at the table with HT2 finishing his snack when music began. He and HT2 would both respond to music and to each other while seated. When joining us on the carpet, one episode portrayed both he and HT2 seated outside of our bouncing song activity, as he was having his bottle. Even from the periphery, he participated and led our bouncing song by his movements and vocalizations, anticipating the final bouncing tune. Benny also participated from the periphery at times, and during the bouncing song, he participated by finding a doll and bouncing it from where he was situated, about three feet away from us. These instances were unexpected to me, and I was both delighted by their participation and by my awareness of them.

Ashlee, who brought Bunny with her most times, danced with bunny in the opening dance segments and later included bunny into the group, as she bounced bunny during the bouncing songs. Going outside of the group, Lily once made a verbal reference to the baby doll that was located on the periphery. She left our group momentarily to retrieve the doll and returned with it, including it into our activity; the doll sat on her lap, as she sat on mine, during the bouncing. Cyndi, who generally exhibited subtle movement responses to music, expanded the song in her own way. She used deliberate gesture by gently pulling her hair with her finger during the “Goodbye” song, as her unique way of expressing the rhythm in the song. As time passed in the study, her movements became bolder, and she led the direction of the bouncing song with grander movements.

Devynn, the youngest, who was usually on her back, “danced” with others who were upright and dancing around her. She responded to us and the music by moving her limbs; similarly, she seemed to move with me when I made physical contact with her, as a way to dance with her while she was on her back. This reciprocal nature of our movements seemed reminiscent of a shared expression of communicative musicality, nurturing a sense of belonging; this type of communication requires us to be in the moment as we “hypothesize the content of the next musical moment based on our experience” (Custodero, 2009, p. 514). As she became more mobile, her “army crawl” to the shakers indicated her intrinsic motivation to join her peers in music. Frederic, who enjoyed dancing with others and was generally captivated by music, gladly left his mother’s side one morning to start music class. He helped me select the first song—a way to initiate the start of music time. In the final classes, he requested that I sing “Twinkle, Twinkle” so that he could dance on the periphery while holding a shaker. All of these moments exhibited to me a sense of choice, leadership, expansion of activities, contributions, and inclusion by initiating their own musical experiences. Marsh and Young (2006) describe musical play as activities that are initiated by the child, that are enjoyable, intrinsically motivated, and child-led. Small describes “musicking” as engaging in music performance, where the meaning “lies in the relationships that are established between the participants by the performance” (1999, p. 9). By inviting infants into musical play, they direct their own musicking, as they interact with their peers and teachers, and find enjoyment in the process.

Creating Community through Music

Trevarthen and Malloch define Communicative Musicality as a way to “converse emotionally with others” (2002, p. 11). Even though the home setting had a higher count of listening behaviors, parent descriptions of musical behaviors that encompassed elements of communicative musicality were found in all types of behaviors. The turn-taking nature of vocalizations and movements, imitation, and laughter apparent in this type of communication cohesively come together in the three dimensions described as pulse, quality, and narrative. We know that infants communicate with others through their innate musicality (Trehub, 2001; Trevarthen & Malloch, 2002), and that their instinctive musical nature is evident in their capabilities in detecting change in music (Trehub, 2001), as was described in Cyndi’s acuity of hearing. In engaging in musical moments with others, meaningful moments are shared within the dyadic relationships, reminiscent of mutuality (Dissanayake, 2000b). At home, this was evident in the shared emotions of joy expressed by both Lily’s and Cyndi’s laughter as they danced with their mothers to the music of Rossini and Beethoven. Even in listening to her mother sing songs during bedtime, there were moments that Cyndi also joined; the intimacy of kissing her mother’s hand during song, as she calls out to her parents implies the bodily expression of belonging, so vital for human well-being (Dissanayake, 2000b).

Benny displayed the call and response nature of his musical “la” conversations with his mother, displaying the pulse and quality of their dialogue as they created their narrative, their musical story. The idea of being attuned to each other without the use of words seemed apparent on this level of communication while forming bonds. The dynamic and tempo of Benny’s vocalizations spoke to the quality of his sound in order to

portray his current state of mood. Devynn's tapping of objects with her mother, also an example of pulse, allowed for practice of timing and anticipation of the next phrase, while observing facial and gestural behaviors of the dyad, as they maintained eye contact. These moments reflect upon the idea of conjoinment, as they communicate together while sharing emotions (Dissanayake, 2000a).

The passing down of stories through music seems to reflect the act of finding and making meaning (Dissanayake, 2000b), as established by adults. This was seen in episodes of the grandparent and Devynn clapping the "Clap Handies" rhyme, Max and his father in the Israeli clapping song, Cyndi's mother singing songs in Chinese at bedtime, and Frederic's father engaging in German action songs—all instances reflect a tradition of passing down cultural knowledge. Other instances of meaningful moments include Lily's morning dance ritual with her mother, or Ashlee's and her father's focused gaze as they both engaged in song during their bedtime ritual. These moments also held a special moment of meaning for the dyads, based on temporal patterns of the movement or gestures, as they conjoin in these shared emotional states (Dissanayake, 2000a). While these moments are not all-inclusive, I received a brief glimpse of their stories, and "as surely as human minds are predisposed to categorize or make narratives, they are inherently receptive to certain structural and performative elements—concrete imagery, striking musical and poetic devices—that by their very nature compel emotional response" (Dissanayake, 2000b, p. 87).

Musically dyadic interactions also occurred at school as described by GA1. Max's musical conversation with her using the syllable "bah" became a game of call and response. GA1 imitates Max's sounds as a way to communicate with him, as they

engaged in this conversation of prosody while practicing musical elements of rhythm, timbre, and dynamics as part of their narrative (Dissanayake, 2000a). During moments of diaper changing, the ebb and flow of musical conversations runs smoothly within the dyad. This was seen with Frederic, as he and various caregivers engaged in musical exchanges during diaper changes, where at times he was the initiator and at other times, teachers sang in order to soothe Frederic to finish the diaper changing task. Ashlee and her teacher exchanged various syllables while on the changing table during their interaction, and she included gestures with her hands to accompany the narrative, which seemed to be enjoyable for both.

Child Culture: Children as Leaders

Many of the scenarios of this study describe the adult following the child's lead. During our music time experiences, I strove (and continue to strive) to provide musical spaces for all infants to lead; I took their cues by hearing their sounds and observing their facial expressions, gestures, and movements. Just as the reciprocal nature of communicative musicality can be seen in the dyads at home (infants and parents) and at school (infants and their teachers), I found Devynn's gestures and movements with me to have a similar effect in the intersubjective nature of our synchronous movements. This happened immediately during our first music session together, as I leaned over her and we gauged our responses to one another. Music was playing in the background, and as I used my hands and fingers to brush over her arms and body, she raised her hands and arms towards me as we maintained eye contact and matched movements. Before picking her up, I focused on reading her facial and bodily cues to see if she would be receptive (this was our first contact). I read her cues correctly, and she invited me to be part of her

music. In following instrumental cues of infants shaking their shakers during the “Shake and Stop” song, or their verbal or gestural requests for songs like “Row Your Boat” or “Twinkle, Twinkle,” or with song books, these infants showed me that they are capable of taking the lead. In return, as they watch each other or watch me, they anticipate the next segment of the musical activity. Custodero’s (2005) study on musical engagement in young children also confirmed that infants (7-23 months) are more than capable of participating within the musical structure. The music class structure was also based on a child-centered emergent curriculum, and flow indicators were found in the infants’ music making.

If we pay attention, infants’ musicking leaves us with clues, as to how they are capable of leading their own learning. Custodero’s (2005) study highlights infants’ abilities to seek out challenge and self-motivate during music class like the infants in this study. It is important to remind ourselves that we can trust in their abilities, as they generate their musical behaviors without our (adults) assertion; and when we are invited, it is a privilege to participate. Trevarthen and Bjorkvold (2016) stress the emotions that play into meaningful experiences; the joy that Cyndi expresses through her laughter while dancing with her mother paints a portrait of Beauty. In Beauty, we experience the feeling of their intersubjective narrative by imagining the contours of their graceful movements together (Trevarthen & Malloch, 2016). Infants anticipate and lead activities with joy; this is who they are and what they do if we let them.

The idea of respecting a child culture means allowing infants to guide their learning. Trevarthen and Bjorkvold (2016) realize a world where young people are active agents of their learning. Rather than “teaching” them and perceiving their learning as

products or outcomes (p. 2), they invite us to embrace the idea that these young beings are imaginative creators of their own art. We are all social creatures who seek companionship, especially through our musicking, as we want to share with others what we learn. Trevarthen and Bjorkvold (2016) discuss the damaging effects on a child when moving from the child culture to the school culture. The school culture represents a structure where “so many things are turned upside down” for the sake of structure and formality (p. 9). To promote thought for comparison, Bjorkvold created a “culture-in-conflict” list using descriptive words to represent each culture. School culture includes descriptive words like, logical, caution, “sit still!”, the expected, reproduction, inadequacy, pedagogical isolation. If we focus on a child culture, we are focusing on the joy that is found within; the following words bring the joy to the fore: authentic, play, humor, intimacy, originality, self-understanding, spontaneity, creativity, the unexpected, “I move –and learn,” (Trevarthen and Bjorkvold, 2016, p. 12). While this is not the exhaustive list, these provide a sense of what it is to promote and nurture a child culture environment.

Role of Adults

Ilari (2017) stresses the importance of parental roles in children’s musical lives. I only witnessed hints of live musical parenting during home visits and during my field observations when parents entered the infant room at the end of the day. Lily’s father changed her diaper while intimately singing to her; on another day I witnessed Lily’s immediate response, as her father’s closeness and soothing singing voice gradually lessened her distress, and as a result, her crying eased into a diminuendo until it ceased. Lily’s father, during our interview, expressed that “music soothes the savage Lily.” This

statement shows me that there is an understanding that infants are musical, and by acknowledging this, we are appreciating their inner vitality, their instinctive need to create and discover, and the internal rhythm, as depicted through their movements as a way of making sense of others without words—communicative musicality.

Devynn and her mother engaging in intimate interactions, involving turn-taking through vocalizations, represents the very nature of the musical interaction between caregiver and child in early communication. In considering the home community, there were many rich descriptions of musicking that involved dancing rituals in the family, music during meal times, as well as sibling musical interactions. At school, infant peers gather together when a teacher starts singing a book, and they contribute with their vocalizations and movement; or, when infants re-enact “Row Your Boat,” by getting into the rocker or platform to enact the boat rocking, as they sing and move together as the teacher sings; or, through their pop beads contemporary ensemble, where infants gather together to explore the new vocal sounds, as they seem to delight in the musicking and community aspects of belonging and being together in this social way; or, the various vocalizations infants engage in when they are seated at the snack table—solo performances invite listeners and even duets, trios, quartets—the infant room community.

Trevarthen and Malloch (2016) describe the playful movement interactions of babies as a kind of language without words to “make sense” of others (p. 8). Whether it is the reciprocal movements to music that Devynn and I explored, as I followed her lead by leaning over her as she lay on the carpet; or, the physical actions of Benny bouncing the doll on the periphery as his way of joining us; or, babies getting into the rocker or platform to guide me in the musicking process; or, Cyndi’s deliberately articulated

gestures as she gently pulls her hair, expressing her interpretation of the music's contour; or, Frederic's gesture and nod as I confirm the song he wants to hear, and then he artfully dances with shaker in hand while all other infants are individually engaged in their musicking process. The movement during music time seems to aptly represent the pulse: as the child anticipates action, like how to move the shakers according to my next singing phrase, timing the behavioral steps; the quality: the expressive movements to the songs I am singing, as they reveal emotions through their intensity; and the narrative: this illustration of our jointly-created gestures, as we work as a music class community, striving for the same joy. This nonverbal musical way is communicative musicality.

Parents and family are the central force that influences infant social engagement (Ilari, 2017). Babies respond naturally to their mothers, and the ways babies interact musically with them are shaped by the mother's beliefs and experiences. Therefore, Ilari argues for discussion and implementation of musical parenting as part of music teacher education and professional development. This supports the tenet that teachers are musical mediators and enhancers, and this partnership between parents and teachers can encourage musical practices at home (Ilari, 2005); it can also support the teacher in meeting the child's needs, by understanding and preserving the home culture values through this community centered approach (Test, 2006), while maintaining the child culture.

Functions of Infant Musicking

In all settings combined, communication had the highest frequency, followed by exploration, undetermined, and then comfort. In each setting, communication was identified as the most prevalent function. After poring over all the episodes several times,

I found it difficult to determine function in general. I also wondered whether specific functions can or should be determined. Considering the theory of communicative musicality, it is not surprising that this study found communication to be the most frequently observable function, serving perhaps as the basis of all functions. Due to the social and active nature of communication, related behaviors seem to elicit an explicitly demonstrated response, whereas comfort might bring out a more passive response. An infant seemingly derives comfort by ceasing to cry or appearing as if discomfort has subsided—perhaps showing comfort is also a way of *communicating* current states of emotions. Custodero et al.'s (2016) subway study generated comfort as the prevalent function. This naturally seems appropriate as the subway is an unfamiliar space in which musicking for comfort “provides a tool for children to address their own needs for coping, to have a sense of potential control” (p. 18). The infant room on the other hand signifies perhaps a safe space for infants to communicate with others, thus generating more communication responses.

Nevertheless, all coders from our consensus team agreed that infants do exhibit intent behind their musical behaviors. In the home setting, communicate, explore, and comfort were the top three functions determined. Comfort for Ashlee involved a parent singing/humming to her while rocking or moving her; for Lily it was similar, as her parents got close enough to her to sing softly, which had an instantaneous effect. Both reflect a closeness and bond through these moments. Communication for Devynn and her mother looked like the turn-taking movements of gestures and vocal sounds between them; for Cyndi, the enjoyment of dancing to Beethoven with her mother highlights the narrative dimension of their jointly created gestures, as they express joy within the shared

pulse and quality of their communication (Trevarthen & Malloch, 2002). Frederic setting up his own equipment to make music possibly reflected a way to entertain himself while also exploring.

In the remaining settings, communication was the most identified function, but this does not suggest that other functions were not present. At school, Benny's vocalizations in the nap room alone seemed to provide a sense of comfort at times, and at other times he seemed to be exploring his vocal range and the various sounds, which eventually moved into his play. Max, upon becoming distressed, was soothed when hearing music. Frederic often sang during solitary play, as if he was entertaining himself or providing comfort, and a friend were accompanying him throughout his play. Lily communicated her song preferences to her teachers by bringing them songbooks or singing fragments of song until her teachers obliged.

In my observations, Devynn explored a variety of sounds as she travelled the infant room. Through her own vocalizations, movements, and instrument playing, she explored objects and her own capabilities. The snack table was another area where sounds were explored, as well as communicated between infants. Lily who also engaged in song during diaper changes, extended her music making to her peers as they engaged in musical play. During music time, Cyndi expanded a musical idea to make it her own, as was seen in her "Goodbye" song gestures, communicating with others, and at the same time maintaining her individuality within the collective. Frederic, who generally did not speak during music time, demonstrated his requests via gestures and also played his shakers in anticipation to the "Shake and Stop" song. Lily expanded her musical experience by bringing in baby dolls to the group, as she communicated musically. Even

from the periphery, Max and Benny participated in music with the group, choosing for themselves the perspective they wished to take in their musicking. Driven by musical participation, Devynn made her way towards the others to join group music.

Musical play occurs in a range of contexts and music seems to be ubiquitous for infants, stemming from musical play at home between parent/sibling and infant through their communicative musicality, to the teacher and infant dyad in the school setting. Marsh and Young (2006) described how children from birth-3 years create their own musical opportunities in both the home or childcare settings in order to deepen their knowledge and experiences. This looks like repetitive behavior as they gain competence in a given musical activity. The infants from this study certainly drove their own musical play, showing that they are capable of engaging musically according to their needs and interests. I particularly noticed that during music time, I could clearly see types of anticipation, expansion, and extension, similar to the outcomes of the infant group as challenge seekers in Custodero's (2005) study on observable indicators of flow experienced during musical engagement. In other words, infants are agents of their own musicking, and through communicative musicality, they are able to communicate with others, to share sympathetic feelings; through the mutual awareness of others, this opens a pathway for confident learning and companionship (Trevarthen & Bjorkvold, 2016).

Social Nature of Infants

Infants are born ready to make music (Trevarthen, 2000) and to be receptive to it. Through their vocalizations, gestures, and eye gazing, infants and adults engage naturally in the musical nature of these interactions. Dissanayake (2012) describes the many benefits of these interactions that lead towards the well-being of infants in relation to

bonding, regulation of emotional states, cognition, socialization, language, and cultural learning, and finally these interactions prepare them to be musical. Babies seek out others for companionship, as seen in the proto-conversations between parent and infant (Trevarthen & Bjorkvold, 2016). Already soon after birth, babies can imitate movements as well as simple vocal utterances; this playful readiness shows a way of communicating to understand others. This relates to the infant's abilities to detect musical elements such as melody, rhythm, and accents, ultimately to detect the emotions in the human voice (Trevarthen & Delafield-Butt, 2014).

From their early musical proto-conversations, infants continue to experience a rapid growth in their social abilities within the first three years of life (Trevarthen & Bjorkvold, 2016). Ready to communicate and seek companionship, infants show their willingness to share feelings with others through their movements. Music serves a social purpose promoting the process wherein children interact with others. Engaging in creative play and sharing their joy with others, babies are perhaps enacting what it means to live meaningfully in community.

Whether alone, or with parents and family members, teachers, or their peers, musical play allows for spontaneous music making that is not bound by rules or constraints and plays an important role in social engagement (Marsh & Young, 2006). Within the emergent curriculum framework, a musical space that is supported by adults allows infants to demonstrate musical agency by initiating their music. In this study, infants participated in musical play regardless of age, and in doing so, demonstrated pro-social behaviors, as they interacted with others. Even in parallel play, they continue to maintain their musical uniqueness within the collective.

In this study, the scenario of maintaining individuality was supported by the emergent curriculum. I observed Frederic during one music class playing his shakers along to my singing; at one point of the song he extended both arms with shakers in hand, shaking them towards Benny, who had been moving and vocalizing on the word “roar” to the one verse of “Row Your Boat.” Both infants were doing their own musicking, in close proximity to each other. They made eye contact, as if to acknowledge each other’s music with respect. The following excerpt from music class is another example of how several infants through their own choices made music together. The timestamp from the video recording illustrates the amount of activity taking place within a short amount of time.

17:10 I ask if we should sing some more. Lily says, “yea” and Frederic nods his head affirmative. When I offer “Twinkle Twinkle,” Lily looks at me, and Frederic nods his head again.

17:25 Frederic walks towards the back of the room with his shakers, and he begins to walk in circles, dancing to the song. I hear Benny’s voice on the side.

17:50 The camera catches Benny, and he is moving/swaying from side-to-side.

18:00-18:39 Frederic continues dancing with his shakers in hand; Benny goes into the rocker and starts rocking. Lily sings “up above” and “like a diamond,” as she smiles at her teacher and to me. I hear someone singing, is it Lily or Ashlee? Ashlee tries to join Benny in the rocker. Benny says, “ahhh,” “no,” and shakes his head “no” while he is on his hands and knees. Ashlee sits back and looks at him. Lily sings the end of the song with me in a quieter voice.

18:38 Ashlee is singing. Benny embraces Ashlee and kisses her, as GA1 gets up to tend to them. Benny leaves the rocker and Ashlee crawls right into the rocker. Frederic continues dancing. Lily says, “more.”

19:07 Both Ashlee and Benny are in the rocker again. Ashlee vocalizes “wo” (row) as she rocks, and Benny vocalizes. Frederic continues to dance behind them.

19:16 I hear, “ah-ee” which sounds similar to when I sing, “sky” and similar even in pitch (Is this Ashlee?).

19:22 Ashlee is now patting her thighs. Benny brings a bottle to Ashlee, she takes it. HT2 tells Benny that the bottle belongs to Devynn. Ashlee laughs and taps it and almost puts it into her mouth before GA1 takes it.

In the social setting I observed, it was clear to me that each infant displayed their agency through their musicking behaviors and intentions, showing the importance of musical play for social engagement (Ilari, 2016). The vitality, contour, emotion, and attunement weaved in to our narratives, as we relate to others through music and with grace—this is the crux of communicative musicality. The dynamics of shared movements come from the jointly created musical narratives between individuals, expressing joy and reflecting Beauty (Trevarthen & Malloch, 2016). In supporting the preservation of child culture, I am reminded of many instances of children leading the music and adults reinforcing their music within this emergent curriculum setting. Infants are enthusiastic performers of communicative musicality and willingly join others as co-creators of these musical narratives. Whether at home, school, or in music class, music is a social act, one that is deeply entwined in the idea of community.

Chapter Summary

Each infant is unique and individual, as was portrayed in their musical portraits in chapters IV and V. Each setting provided a behavioral lens while examining infants in their various music making behaviors. Music serves important functions for infants and provides many benefits for individual well-being. The dyadic musical relationship begins at home. The act of communicative musicality is present through these parent/caregiver and infant interactions. These communicative musical acts serve as the foundation for later social development in an infant's life. At school, infants form relationships with

teachers and subsequently their peers. Within this emergent curriculum setting, they learn about the world around them and how to live in it. The musical spaces in this setting provide opportunities for infant musicality to flourish and allows for musical agency, as they explore the various areas and objects within this setting. During music time, infants express themselves through their musicking, as they maintain and develop their individual and unique musicality, while still being part of the collective. Musical play is an integral part of well-being within the adult/child dyad extending into the infant community. Allowing space for musical play fosters agency in all settings. As they transition from parallel play into a shared world of understanding through musical play, music serves as a pathway for overall social engagement.

VII – SUMMARY, FINDINGS, RECOMMENDATIONS, AND IMPLICATIONS

The purpose of this study was to explore and understand the function of music in a community of infants. This dissertation focused on the musical lives of 7 infants in the following settings: home, school, and music class. My aims were to investigate the ways in which infants are musical, how parents and teachers perceive musical behaviors in infants, how the musical behaviors of infants compare in different settings, and the possible functions that the behaviors serve. Two theories that informed my research and provided an analytic lens were Communicative Musicality (Trevarthen & Malloch, 2002) and psychobiological needs that stem from relationships and act as essential components to human well-being (Dissanayake, 2000b). Given that both theories support the viewpoint that we are born musical, and our vocal, facial, and gestural behaviors serve as tools in the sharing of emotions between infants and others, I examined the behaviors of infants within an emergent curriculum setting with the foundational assumption that behaviors observed stemmed from a natural and organic way of being musical.

This case study lasted approximately four months and comprised a community of infants who, at the beginning of the study ranged from 6 months to 20 months. Using information from parent and teacher interviews, parent- and teacher-submitted diary entries and artifacts, weekly field observations, and 10 video recordings of music classes, I extracted data in the form of musical episodes (587 total), where the individual child's musical experience served as the unit of analysis. I reported findings from data analysis by creating individual portraits of each child framed within different settings from the

perspectives of the parents, teachers, researcher, and music teacher. These portraits were divided into two chapters to accommodate two age ranges: infants 15-23 months and infants 6-15 months. Findings confirm that even though each infant is unique in their music-making behaviors, they all demonstrate musical agency. An analysis of the 7 infants in different settings identified prominent musical behaviors and their possible functions in each setting. The musical nature of infants at home and at school was observed through their musical behaviors alone and with others. Music served an important role in infants' daily lives that promoted social engagement and well-being within the community framework.

Research Questions and Findings

The following section addresses the research questions stated in Chapter I. The findings of this study are presented as answers to the research questions.

RQ 1. What are the ways in which infants are musical? (a) What behaviors are considered vocal? (b) What behaviors are considered movement?

All data collected in this study were analyzed to identify and categorize the musical behaviors of seven infants. Using the music behaviors checklist (Appendix D), vocal, movement, and instrument play behaviors were identified according to the descriptions provided. I also provided this checklist to the consensus team, as a guide when examining episodes during the reliability check.

Infant musical behaviors were identified as vocal, movement, instrumental play, and listening. Vocal behaviors consisted of coos, sounds created by lips, teeth, or tongue, ascending and descending glissandi (slides), elongated sounds, intervals, song fragments,

generic sounds (ah, eh, boh, mmm, etc.), various syllables, and sung syllables or sounds that were on pitch. Movement behaviors in response to music include stopping and starting action to music, moving arms/legs, swaying, rocking, bouncing, twisting, dancing (turning), clapping, and gesturing with hands. Instrument play, which involves movement, was identified as actively making sounds with environmental objects and toys and tapping or banging an object or surface with hands or body parts.

While listening behaviors were not originally on the checklist, they were often observable as infants turning their head in response to music, showing a focused concentration or some form of acknowledgement like intensive listening (pausing to listen), or making eye contact while being soothed with music. In this study, listening seemed to indicate the absence of initiated movement or vocalizing. It seems there may be types of listening behaviors. In embodied listening, movement is involved when the child listens to music, and in receptive listening, the child appears to be taking in music. After reviewing the data, I consider both instrument play and listening as their own behaviors.

RQ 2. What do parents and teachers report about infants by observing their music making? (a) What do parents report regarding musical behaviors in the home? (b) What do teachers report regarding musical behaviors during music time and outside of music time? (c) How do the musical behaviors of infants vary depending on whom they are with?

Interviews and diary entries from parents and teachers were used to report behaviors that infants engaged in whether alone or with others. At home, listening and movement were identified as the behaviors observed most often. Parents reported that

listening behaviors were identified when a) music captivated the child's attention and b) when they would sing to comfort the child. Parents reported movement behaviors as a way for infants to initiate and engage musically with parents or family members, while connecting with culture and bonding in the process. The younger infant group created sounds with objects and responded to their own sounds through their movements. Parents also reported that infants demonstrated preference and choice of musical activity by initiating the activity independently for solitary or cooperative musical play and engaged in a special type of movement/dance to communicate with parents. Parents also seemed surprised at the musical perception that babies seem to possess.

At school, vocal behaviors were identified as the most prevalently observed. Through singing, infants made song requests, and they also engaged in singing during solitary play. Singing was also used to engage others in music making activities like Row Your Boat, where peers will reenact the scene together. Diaper changing was another time that singing occurred between the teacher and infant. Infants also engaged in musical conversations in a call and response nature with teachers. These playful interactions provided entry points into the social and physical worlds around them, as they interact with adults and peers, while learning about their world.

From the researcher's perspective into the classroom, infants engaged in musical play due to the musical spaces afforded them in the environment. Also exhibiting a high number of vocal responses, infants vocalized around certain areas or with objects. These areas included the snack table, as infants vocalized alone or with others, the diaper changing table, and nap rooms (solitary or with others). Infants vocalized on, in, or around objects that included the trampoline, large wooden rocker, wooden platform, and

the stability ball. Infants with objects in hand included the dustpan and broom, spoons, and various playthings and soundmakers from baskets located the classroom.

During music time, infants exhibited a high number of movement behaviors. Whether from the periphery or within the group, infants participated in music class by initiating and leading activities. Within all the activities like dancing, bouncing songs, song books, instrument play, and activities involving scarves, infants made requests and found their own unique ways to express themselves through their behaviors. Infants also anticipated, expanded, and extended musical activities.

Vocal behaviors ranked highest in observed behaviors overall. While reports identified prominent behaviors in each setting, all behaviors had a place in infant music-making. Possible explanations for the lower number of vocal behaviors in the home setting compared to the school settings may be due to the accessibility of screens to watch/listen to music and possible differences of an individual's conception of singing in infants; vocal behaviors might have been under-reported. The contrast between music class data (less vocal behaviors) and school/field observation data could be attributed to the more structured nature of the class. This structure provided a way of "making special" which led to delayed imitation/extension of musical activities that originally took place during music time into the less structured class setting.

RQ 3. What function(s) do the musical behaviors serve?

Functions identified in the four settings of this study were mostly adapted from the Custodero et al. (2016) study. They include the following: to communicate with others, to comfort/entertain self, to explore, to accompany motor activity, and to accompany imaginative play. While I was not able to determine function for a number of

behaviors (coded as “undetermined”), the most prevalent perceived functions were to communicate with others, to explore, and to comfort. Music serves important functions for infants, and when examining their behaviors and the functions they serve, there are a diverse array of functions, and they look different for each infant. Considering the theory of communicative musicality, it seems appropriate that this study had the highest number of behaviors identifying communication as the function, serving perhaps as the basis of all functions.

Based on these findings, the following conclusions can be made:

- Each infant is unique; each infant used their own strategies to seek out and respond to music. Through music making alone and with others, the infants engage in vocal, movement, instrument play, and listening behaviors. In understanding that infants are innately musical, we can determine that infants express themselves through musical behaviors. As such, their musical behaviors are unique to the individual. In this study, no two infants musicked in exactly the same way, suggesting that musical identities are infinitely diverse, given the array of social and cultural influence possible in the early years.
- Infants demonstrate musical agency. In this child-centered environment, infants had song preferences, led musical activities, initiated musical play, and created sounds and instruments. They also displayed flow indicators that include self-assigning, anticipating, expanding, and extending music activities. The music perception of infants was evident through their music-making in all settings. Within the emergent curriculum framework, infants are

supported in their musicking choices by providing space for them to exercise their agency.

- Music serves purposes for infants. As music seems to serve a variety of purposes depending on the child's needs and what is meaningful for them, the ways in which music functions looked different in each child, depending on their behaviors and the context.
- Music serves as a pathway to healthy social engagement which stems from the foundation of the infant/caregiver dyad, later extending to other relationships. Within this infant room setting, musicking afforded a space for infants to practice their innate musicality while maintaining their individuality. In coming together as a group, they reinforced their sense of belonging, as they came together as a community.

This study explored the musicking behaviors of infants beyond the caregiver-infant dyad, extending to the broader social context. In seeking the function of music within the context of the infant room community, my methodological aim was to learn how to tend to the child's individual voice. The framework discussed in chapter six focuses on the child's communicative pathway moving from the dyadic relationship to interacting musically with others. Through musical play infants are invited to participate within the social setting, while maintaining their individual ideas, and thus their unique ways of expressing their music within the collective. Music then functions for this community of infants as a way to maintain their individuality while developing relationships, and the ways in which they work in the world.

Limitations and Recommendations for Future Research

This study focused on seven infants and their musical behaviors within an emergent curriculum setting. This case study of the infant community is not generalizable due to the unique qualities of each infant and the particular philosophy the center follows. This research shows that when teachers and parents are attuned to infants and make efforts to read infant cues, infants can and will engage in musicking in the ways that are meaningful for them. I recommend expanding this research to a larger sample size in other childcare settings, possibly with differing philosophies. Extending this research further, one could look at the impact of a musical intervention to provide resources for families to better communicate and relate.

As this study provided a glimpse of the nature of infants in musical play with their peers, I recommend further research into peer relationships and how they develop through music. Although identifying behaviors and functions by counting provided insight into the nature of infant musicality, I discovered their individual stories were more valuable in understanding the unique ways children express themselves through music. In determining functions for musical behaviors, a challenge was posed when coming to a consensus of determining functions in children, especially with the limited context provided in the data. For improving practices, perhaps having a co-researcher or team would help to minimize discrepancies if all were involved with the study from the beginning in order to know the children. While it is evident that music serves an important function for young children, further exploration in this area would be beneficial in learning about meeting children's needs musically for overall social development.

During this study, I examined 587 episodes (934 behaviors) by categorizing the behaviors and their possible functions in each setting. I also indicated who initiated the musical behavior (child, adult, peer, undetermined) in each episode. While I did not use this information to inform this study, it would be worthwhile to explore this study or future studies with this information in mind and how it might influence music-making. Other areas that I found interesting that could be developed for further study are the routines and rituals around music-making. It would be interesting to conduct a large survey of childcare centers in order to know more about what kinds of singing rituals and songs teachers might use. During diaper changes for example, it would be interesting to know when function might shift from comforting the child to the child initiating musical behavior in order to communicate with the caregiver. I also found parents and teachers had their own musical stories to tell. In a few instances, I could feel a sense of intimacy in both parents during the interviews when reflecting back on their musical memories, either as a child, or musical memories associated with their respective partners. It would also be beneficial to explore how parents' musical background and beliefs influence the musicking of their children. As I also gathered interesting data related to teachers' musical background, it would be interesting to delve further into how their backgrounds affect their musical caregiving.

Implications for Music Education

As the "music teacher" in this study, I strove in every class to listen attentively and carefully observe each infant. Sometimes the cues are so subtle, they can easily be missed. What was and is still of great value to me is being able to refer to the teachers in

the classroom. If I was unsure of whether I was reading an infant signal correctly, I would ask the teacher for clarity or confirmation in the moment. In early childhood, I certainly believe that the child-centered emergent curriculum setting is of great value in the musical development of young children. Music educators are encouraged to keep their eyes and ears open and to be brave in letting children lead. It can be an uncomfortable experience for music teachers to not completely meet their teaching agenda, and it can be easy to mistakenly change activities too soon because one feels there is no need for the repetition or that the teacher has had enough of a particular song. However, a valuable experience can be gained by allowing flexibility in the lesson structure, and knowing when to prolong certain activities, and when to move forward. By requesting and choosing particular activities according to their needs, infants and young children are in control of their learning and what appears to be, “arbitrary and repetitious behaviors can hold a key to children’s current competencies” (Marsh & Young, 2006, p. 7). It is not about our agenda, it is about infants and their musical agency.

Musical development and interactions begin early with the caregiver-infant dyad and move into the dyad of the teacher-infant in the childcare facility. Music should be part of any school curriculum no matter the age. This study was not just about infants, it was about human beings. A few parents in this study did not consider themselves musical. Knowing that music is an important part of infant life, parents and teachers, having the opportunity to be attuned to infant needs, are invited to identify musical cues in infants, so that they can engage in meaningful musical interactions. Certainly, music teachers partnering with childcare teachers would benefit the child, and as mentioned in

chapter two, parents can take on the role of musical mentors and music teachers as musical mediators and enhancers.

Expanding into elementary school settings, I noticed that there are schools where music is not part of the curriculum for some grades. I currently teach a music methods course for non-music early childhood and elementary teacher candidates. I notice that some of these candidates start the semester not understanding how this particular course is relevant to them. This study showed how infants engaged in music with others during music class by taking the lead and subsequently guiding me into their musicking preferences. Musicking did not stop when music class ended; they extended music activities from class into the daily life of the community, both in the infant room and at home. Therefore, I invite non-music specialist teachers and teacher candidates to embrace and invite music into their lives. This would make a powerful partnership between the classroom teacher and the music specialist (if there is one) in order keep music alive for their students. I stress that music is a vital component to human beings, not only as a benefit for other academic areas (although this might be the case), but purely for the sake of music and human well-being, which itself is enough of a rationale. Working with this age group in this setting has changed how I teach by being in the moment with these musical beings and by making room for their musical contributions where they can act as agents of their own learning. I might not catch all the cues, but I strive towards it. To do this, we must listen and trust.

Revisiting my Assumptions

In revisiting my assumptions in Chapter I, I would like to offer the following modifications:

- I would like to add to the definition I provided for identifying musical behaviors. I stated Mithen's definition as, "variations in pitch, rhythm, dynamics, and timbre, by a combination of the voice, body and material culture (2009, p. 3). By adding Small's definition of musicking, I allude to the necessary component of community- and relationship-building through music. Musicking is described as engaging in music performance, where the meaning, "lies in the relationships that are established between the participants by the performance" (1999, p. 9). In acknowledging the relationship aspect of this definition, we attend to their musical behaviors because of their function in seeking and creating meaning.
- Music bonds infants and others. In my earlier assumptions, I referred only to the dyadic relationship between the caregiver and infant. I now extend this dyad to include teachers and the peer relationships formed through, in, and around music.
- The human voice is an organic instrument considered part of knowing the self. I expand this to include the organic music-making that includes all musical behaviors: vocal, movement, instrument play, and listening.

Reflection/Coda

When I began this study, I was new to this population of children. I was especially drawn to the infants who would become the basis of my learning and research. Stemming from my interest in the unheard, most likely from being underserved in that respect myself, I wanted to find situations and methods that allowed all humans to feel empowered as their voices were heard. No language necessary. Just music. By focusing on infants, I felt I was going back to our collective roots, mirroring my own beginning, as if I had a chance to do it all over again. How would I have wanted to have been treated/raised? How would I have wanted to have been heard? I am sure I would have wanted the care, attention, and love that these parents and caregivers give to these infants.

As I observe and realize that through their musicking, infants learn about the world around them, I think about where our musical lives begin. That infants are born with inherent musicality sets the stage for a musical life. As expressed in Chapter I, I had an inclination that attending to the voices of infants might allow us to discover how human beings come to know themselves through music-making, as listening to an individual's voice is listening to their music. Given a student-centered approach, I could visualize these conclusions as being applicable to other populations, in my particular case, to the applied voice students and the developmentally challenged adults with whom I work, as mentioned in Chapter I.

From this study of seven unique and musical individuals, I have indeed observed and interpreted how these infants learn about themselves and others through music, and the emergent curriculum has provided me the opportunity to listen to their voices—their music. What is astonishing is that through their musicking, I learned about myself.

Working with infants has taught me to see the world differently, as did this mysterious process of research. Re-search. To search for again. To find myself and my voice again through the music of others.

Approximately one year later after data collection, where are these musical beings now?

- Cyndi: currently in the toddler room. At the end of each music class, I sing a goodbye song using a melody based on Beethoven's Pastoral symphony. When I start this song, Cyndi immediately sits on my lap, as we sing goodbye to each toddler. It seems the connection to Beethoven still exists.
- Frederic: no longer at the center. My first musical memory of Frederic was when he was a young infant. The first time he crawled was when I put down the basket of shakers on the carpet. His teachers excitedly took photos of this moment. It is no wonder he continued to love his shakers during music class.
- Lily: currently in the toddler room. Lily, still the astute observer, smiles each time we interact musically together. During music time, she continues to sing along with me when learning new songs, just as her parents reported her as keeping up and learning songs with upbeat tempos and complex lyrics.
- Benny: currently in the toddler room. Benny to my surprise does not seem to make as many vocal sounds as he used to during music. However, he still participates in and out of the music group, usually on the periphery. Just when I begin to wonder if he is engaged with the current activity, he pops in (usually standing in front of me at eye level) and offers his acknowledgement and contribution, with a knowing half smile and twinkle in his eyes.

- Max: no longer at the center. I worked with Max in the toddler room before he and his family relocated. During toddler music, he continued to participate from the periphery, in the vicinity of an encouraging and caring toddler teacher. While it was not the same teacher from the infant room, he continued to make-music with his new teacher.
- Ashlee: currently in the toddler room. Ashlee continues to sing frequently, usually accompanied by her bunny. She continues to include Bunny in musical activities, just like she did in the infant room. Both at home and during toddler room play, she has been seen/heard singing and reenacting a range of different songs that we have done during music.
- Devynn: remains in the infant room. Once the youngest infant, Devynn is now one of the oldest infants in the infant room. She is walking (no more “army crawls”) and enjoys dancing with others and by herself when singing or recorded music is heard. She makes her own musical choices when engaged in musical play with her peers, just as she did as a young infant.

As I think of these seven musical individuals, I see infants/toddlers who continually find their voices through music. They know internally what they need, and it is up to us as caregivers, parents, teachers, and adults to respect their choices and agency. By affording these individuals spaces to engage in their music, we allow them to learn about themselves, and in return we learn about ourselves. From our work together, I am eternally grateful to these beings who changed my life and how I perceive babies, music, and the world forever.

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APPENDICES

Appendix A – Teacher Interview Protocols

Teacher Interview 1	Questions
Introduction	Thank you for taking the time to speak with me today. I am conducting a research study on infant musical behaviors and their functions. I will be asking you some questions about your musical background, some of your personal and professional experiences, including your experience with infants. I will also be explaining the diary study in detail at the end of the interview. If you don't mind, I am going to record our conversation. Do you have any questions before we begin?
A. Background Information and Musical Experience	<p>Tell me a little bit about yourself like where you are from, what you do for a living? (Tell me about your work)</p> <p>What made you interested in working with infants? (Was there a specific event...?)</p> <p>Does music have a role in your everyday life? Can you tell me more about that?</p> <p>Does music have a role in your teaching life? Can you tell me more about that?</p> <p>What role, if any, does music play in your work with infants?</p>
B. General Questions: Infants and Music in the Classroom	<p>Tell me about your work here at the (name of early childcare facility).</p> <p>How do you see the center's mission or philosophy? Do you think music supports the center's mission? If so, how?</p> <p>How does the music you (infant teachers) choose to do in class relate to the mission?</p> <p>Related Questions:</p>

	<p><i>What types of musical activities happen in the classroom? What are some musical activities used in the classroom? Do you notice infants singing on their own?</i></p> <p><i>How is music and singing used in the infant room? (Do you play music, have instruments, sing, listen to music...)</i></p>
C. General Infant Information	<p>Do you have a key child/children? Tell me about them. (his/her development over the last year, routine, likes/dislikes, etc.)</p> <p>How long have you been working with infants?</p> <p>How do they let you know when they need something? How do you understand their needs? <i>(When you want to tell them something, describe how you might do that.)</i></p>
D. Musical Behaviors (for each infant)	<p>How are infants musical? Can you give some examples?</p> <p>How does he/she engage in music on a daily basis?</p> <p>Does he/she have any favorite music he/she likes to listen to?</p> <p>Does he/she have a favorite musical activity?</p> <p>How do you interact with <u>(name of infant)</u> musically? Why?</p> <p>Responses</p> <p>What have you noticed in his/her response to music? (Have you noticed any special responses from him/her to music in body language, gestures, vocal sounds, or facial expressions that you have witnessed? <i>Can you expand upon why? Why do you think he/she likes that?</i>)</p> <p>Peer interactions</p> <p>Are there infants that hang out together? Tell me about them. (Tell me about ____ and how he/she interacts with the other infants?)</p> <p>Are there other infants with whom he/she interacts with musically?</p> <p>Describe a time you remember when you used music with the infants? Describe a time when you noticed the infants making music? What do you think provoked it?</p>

	<p>Can you share one memory where you initiated something musical with (name of infant)?</p> <p>Can you share one memory where you noticed his/her in the absence of adults initiating musical behaviors?</p>
E. Additional Questions	(Insert relevant questions here)
Closing and further questions or discussion on shared documentation/artifacts	<p>Do you have any questions for me? Is there anything else you would like to share with me?</p> <p>I don't have any more questions at the moment.</p> <p>Please feel free to share any photos, video clips, or objects that you feel might be helpful in showing (name of child) musically.</p>
Transition	Thank you. Now I'd like to tell you about the diary study...

Teacher Interview 2	Questions
Introduction	Thank you for taking the time to speak with me today and allowing me to ask you some follow up questions regarding general infant room information and musical behaviors. If you don't mind, I am going to record our conversation. Do you have any questions before we begin?
C. General Infant Information	<p>Throughout the year, I notice that the infant room set up/materials change. How often does it change and how does this come about?</p> <p>Are there any other times during the day where group time is incorporated? Does it involve music?</p>
D. Musical Behaviors (for each infant)	<p>Regarding the musical behaviors of each infant, how do you notice these behaviors evolving or changing?</p> <p>Is there a particular time of day (during certain routines or activities) in the classroom where infants show musical behaviors?</p>
Preferences/Favorites	<p>How have the interests of each infant changed during this term (developmentally and musically)?</p> <p>Do the infants have a favorite musical activity (or object) that you see in the classroom? Do any of them come from music time? What tells you that it's a favorite?</p>

Appendix B – Parent Interview Protocol

Parent Interview	Questions
Introduction	Thank you for taking the time to speak with me today. I am conducting a research study on infant musical behaviors and their functions. I will be asking you some questions about your musical background, some of your personal and professional experiences, including your musical experiences with your child. I will also be explaining the diary study in detail at the end of the interview. If you don't mind, I am going to record our conversation. Do you have any questions before we begin?
A. Background Information and Musical Experience	<p>Tell me a little bit about yourself like where you are from, what you do for a living? (Tell me about your work.)</p> <p>Do you have other children?</p> <p>Does music have a role in your everyday life? Can you tell me more about that?</p> <p>What role, if any, does music play in your experiences with (name of child)?</p>
B. General Questions: Music at Home	<p>What attracted you to (name of early childcare center)? <i>Possible follow up questions related to music and their answers</i></p> <p>Do you have any memories of music when you were a child? How did music play a role in your childhood? Since you had this experience (or don't remember any experiences), do you think that has an influence on the way that you interact with your child?</p> <p>Tell me about the things you do for fun? Do you get out pots and pans and let (name of infant) play? Do you ever play music for him/her?</p> <p>Have you ever heard (name of infant) singing on his/her own?</p>

C. General Infant Information	<p>Tell me about (name of infant). (his/her development over the last year, routine, likes/dislikes, etc.)</p> <p>How does ___ let you know when he/she needs something? How do you understand his/her needs? (When you want to tell ___ something, describe how you might do that.)</p>
D. Musical Behaviors Preferences/Favorites Responses Peer interactions	<p>What is ___ like musically, do you think? Can you give some examples?</p> <p>How do you interact with ___ musically? Why? Do you watch music DVDs together? Which kind? Do you listen to music together?</p> <p>Does ___ have any favorite music/songs he/she likes to listen to? Does ___ have any musical videos that he/she likes to watch? Does he/she have a favorite musical activity?</p> <p>Is ___ involved in other extracurricular activities, those that involve music?</p> <p>What have you noticed in ___'s response to music? (Have you noticed any special responses from ___ to music in body language, gestures, vocal sounds, or facial expressions that you have witnessed?) Can you expand upon why? Why do you think he/she likes that?</p> <p>Do you know other people in the infant room? Are you friends with them? Tell me about ___ and how he/she interacts with the other infants in the infant room? Is there another child with whom he/she interacts with musically?</p> <p>Does he/she have cousins or do you have friends with children the same age (play dates)?</p> <p>Describe a time you remember when you (or your spouse)</p>

	<p>used music with your child? Describe a time when you noticed your child making music?</p> <p>Can you share one memory where you initiated something musical with ____? Can you share one memory where you noticed him/her in the absence of adults initiating musical behaviors?</p>
E. Questions that emerged from video clips or other data	<p>(Insert relevant questions)</p> <p>(Show chosen video clips) Example question: What do you find interesting or confusing in this clip?</p>
Closing and further questions or discussion on shared documentation/ artifacts	<p>Do you have any questions for me? Is there anything else you would like to share with me? I don't have any more questions at the moment. Please feel free to share any photos, video clips, or objects that you feel might be helpful in showing (name of child) musically.</p>
Transition	Thank you. Now I'd like to tell you about the diary study...

Appendix C – Field Observation Protocol

Topic Label: (Brief, descriptive topic label that captures the essence of the field)		
Observation Number:	Date/Time:	Location:
Descriptive Notes/Sequence of Events	Reflection	Key Words
Setting Description:		
Sequence of Events:		

Appendix D – Music Behaviors Checklist

Vocal Development
Coos or vocalizes when alone
Coos or vocalizes in response to adult interaction
Creates other vocal sounds using teeth, lips, tongue
Glissandi: descending, ascending, or combination
Imitates adult (or child) inflection in vocalizing (rise/fall in pitch) (in tune, almost in tune, acceptably in tune)
Sings while looking at a picture book
Sings to accompany other routine activity
Sings along with... (adults, children, recordings, etc.)
Matches pitch
Creates own "songs," meandering tunes
Intervals
Sings fragments of existing songs
Generic sounds (ah, eh, boh, mmm, etc.) not very definable /syllables
Sung syllables or words
Other

Movement Response
Turns head or moves eyes in response to music
Moves arms and legs in response to music
Movement stops and starts in response to music/silence
Sways or rocks (back and forth or side to side)
Bounces (up and down)
Adds twist and turns to movement ideas
Dances (by turning around in circles)
Imitates dance movements of someone or T.V.
Other: clapping, sign language

Instrument Play
Actively makes sounds with environmental objects and toys
Shows preference for certain sound sources
Other: Tapping/banging an object or surface with hands or body parts

Appendix E – Teacher Diary Example and Template

MUSICAL BEHAVIORS PROJECT DIARY

As part of my study on the musical behaviors of infants and the functions of their musicality, I am collecting information about the day-to-day musical behaviors of infants. I am asking you to keep track of any musical behavior that you might observe in the infant classroom. You may record individual children or several of them together. Examples might include singing, moving to music, or playing instruments or toys. Go about your day as you normally would, but whenever you hear and see infants doing something you think is a musical behavior, please record the following:

When: Date, day, and time

Who: List all people involved in the activity

Where: Section of the infant room, or another location (like the park)

Describe: Give details about what happened

Comments: Share any feelings, thoughts, or questions you might have about what you see, hear, and experience. Examples might include whether this was part of the daily routine, or that the child was imitating something seen or heard, or how you feel about seeing your child singing a particular song.

Sample Teacher Diary Entry for Joey My name: Noreen

When: Nov. 15, 2016 1:00pm
Who: Joey 11 months, Noreen (graduate assistant)
Where: In the infant room, changing station
Describe: While changing Joey's diaper, I spun the mobile above to get his attention so that I could position him for a diaper change. As he was smiling, I began to sing "Wheels on the Bus" since I knew that he likes this song and it helps to calm him down for the change. During changing, Joey shook his hands and legs/feet to my singing. When I stopped singing, he began to make long quiet sounds, like he was singing.
Comments: Joey is usually cooperative for diaper changing, however he can get impatient at times. I usually move the mobile to catch his attention and sing to him so that I can keep him occupied while changing.

This is just one idea of how to record what you see, hear, and feel. Please record what you think is important for me to know. You may either send me an audio file of the recorded behavior via phone or email, or you may type up your entry and email it to me. Thank you again for your help.

Teacher Diary Entry for (Name of infant) My name: _____

When:
Who:
Where:
Describe:
Comments:

Appendix F – Parent Diary Example and Template

MUSICAL BEHAVIORS PROJECT DIARY

As part of my study on the musical behaviors of infants and the functions of their musicality, I am collecting information about the day-to-day musical behaviors of infants. I am asking you to keep track of any musical behavior that you might observe in your child. Examples might include singing, moving to music, or playing instruments or toys. Go about your day as you normally would, but whenever you hear and see your child doing something you think is a musical behavior, please record the following:

When: Date, day, and time

Who: List all people involved in the activity

Where: The room in the house or location away from home (like the park)

Describe: Give details about what happened

Comments: Share any feelings, thoughts, or questions you might have about what you see, hear, and experience. Examples might include whether this was part of your daily routine, or that your child was imitating something seen or heard, or how you feel about seeing your child singing a particular song.

Sample Parent Diary Entry for Ellen My name: (parent's name)

When: Monday, Nov. 28, 2016 6:15pm
Who: Ellen (16 months), mom
Where: In the kitchen
Describe: Ellen was sitting on the floor with some pots, pans, and wooden spoons that she requested. As I was preparing dinner, I (mom) started singing Twinkle, Twinkle Little Star while Ellen was tapping on the pans with her hands. I sang the song about three or four times, and she continued tapping while singing some parts of Twinkle with me. It wasn't continuous, only parts of the song, or rather sounds (without clear words) were heard.
Comments: I like to sing "Twinkle, Twinkle" to Ellen when she is about to fall asleep because she likes this song and it seems to help her calm down. She is also familiar with it at the childcare center as well.

This is just one idea of how to record what you see, hear, and feel. Please record what you think is important for me to know. You may either send me an audio file of the recorded behavior via phone or email, or you may type up your entry and email it to me. Thank you again for your help.

Parent Diary Entry for (Name of infant) My name: _____

When:
Who:
Where:
Describe:
Comments:

Appendix G – Invitation Letter for Teachers

Dear Infant Room Teacher,

My name is Nita Baxani and I am a doctoral student at Teachers College, Columbia University in the Music & Music Education Program. Since becoming the music instructor for the infant room, I have become interested in the musical behaviors of infants. It was during my observations in the spring of 2016, as well as a pilot study that I conducted, that I developed my research focus. The title of my study is: Examining the Functions of Infant Musicality Within a Childcare Community. I am studying the musical behaviors of infants in the infant room setting because I want to find out what those musical behaviors are and how they function so that parents, caregivers, and teachers can be informed about how to support and cultivate infant musicality in order to foster healthy development and wellbeing.

I am hoping that you can assist me in this study during which I would like to interview a maximum of two times. The study will take place from January 2017 through May 2017. Teachers in this study should currently work in the infant room and be well acquainted with most of the infants and have substantial contact time with them. I will also be conducting weekly field observations in the infant room and from the observation booth approximately 3-5 hours per week. In-classroom observations will be scheduled at the convenience of the infant room, as directed by the head teachers. I would like to give you a diary template to record infant musical behaviors three times (one week increments) throughout the duration of this study. This can be sent to me as a written or audio file by email or text message for your convenience.

With your participation, I hope to gain insight and knowledge for my study. I will contact you within a few days in hopes that you will participate in my study.

Thank you very much for your consideration. I am happy to address any questions or concerns you may have.

Best regards,

Nita Baxani
Doctoral Student
Music & Music Education
Music Instructor, (Name of Childcare Center)
Teachers College, Columbia University

Appendix H – Invitation Letter for Parents

Dear Parent,

My name is Nita Baxani and I am a doctoral student at Teachers College, Columbia University in the Music & Music Education Program. Since becoming the music instructor for the infant room, I have become interested in the musical behaviors of infants. It was during my observations in the spring of 2016, as well as a pilot study that I conducted, that I developed my research focus. The title of my study is: Examining the Functions of Infant Musicality Within a Childcare Community. I am studying the musical behaviors of infants in the infant room setting because I want to find out what those musical behaviors are and how they function so that parents, caregivers, and teachers can be informed about how to support and cultivate infant musicality in order to foster healthy development and wellbeing.

I am hoping that you can assist me in this study. I would like to interview you once during the study preferably in the home environment of your child. This will be scheduled at your convenience early in the study. The study will take place from late January 2017 through May 2017. I would also like to give you a diary template to record your child's musical behaviors three times (one week increments) throughout the duration of this study. This can be sent to me as a written or audio file by email or text message for your convenience.

With your permission to observe your child in the infant room community and your participation, I hope to gain insight and knowledge for my study. I will contact you within a few days in hopes that you will participate and allow your child to be part of my study.

Thank you very much for your consideration. I am happy to address any questions or concerns you may have.

Best regards,

Nita Baxani
Doctoral Student
Music & Music Education
Music Instructor, (Name of Childcare Center)
Teachers College, Columbia University

Appendix I – Informed Consent for Teachers

Teachers College, Columbia University
525 West 120th Street
New York NY 10027
212 678 3000

INFORMED CONSENT

Protocol Title: Examining the Functions of Infant Musicality Within a Daycare Community

Teacher Interview Consent

Principal Investigator: Nita Baxani, Teachers College, 917-275-4080

INTRODUCTION

You are being invited to participate in this research study called "Examining the Functions of Infant Musicality Within a Daycare Community." You may qualify to take part in this research study because you currently work with infants in a university affiliated early childhood center, and have been working with them since the beginning of the academic school year. You are well acquainted with the infants and have had and will have substantial contact time with them. Approximately 18 people will participate in this study and it will take 3-4 hours of your time to complete.

WHY IS THIS STUDY BEING DONE?

This study is being done to determine the functions of musical behaviors in infants. Research in the area is limited and it is my hope that through this study, we can learn more about how infant musical behaviors are present in the daycare and home settings.

WHAT WILL I BE ASKED TO DO IF I AGREE TO TAKE PART IN THIS STUDY?

If you decide to participate, you will be interviewed by the principal investigator. Your participation will involve up to two face-to-face interviews with the researcher regarding your perspectives of infant musical behaviors as a caregiver in an infant classroom. This interview will be audio-recorded. After the audio-recording is written down the audio-recording will be deleted. If you do not wish to be audio-recorded, you will be able to participate, and the principal investigator will take notes by hand during the interview. The interview will take approximately thirty to sixty minutes. You will be given a pseudonym in order to keep your identity confidential.

In addition to interviewing, I will be observing the infant classroom on a weekly basis. I will be taking notes, as I observe the interactions of infants with their peers and caregivers. As the music instructor of the infant room, I will also video-tape these thirty minute lessons as

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part of my teaching practice, as has been done in the past and for identifying musical behaviors for this study.

Finally, you will be asked to record musical behaviors into a teacher diary template. This will take place during three separate weeks throughout the duration of this study, after the first interview, and spaced out throughout the spring term. These entries can be sent to me as a written or audio file by email or text message. All of these procedures will be done at Teachers College at a time that is convenient to you.

WHAT POSSIBLE RISKS OR DISCOMFORTS CAN I EXPECT FROM TAKING PART IN THIS STUDY?

I do not anticipate any risks to you participating other than those encountered in day-to-day life. Your participation in this study is voluntary, and all names will not be disclosed. You may choose to withdraw from the study at any time.

The principal investigator is taking precautions to keep your information confidential and prevent anyone from discovering or guessing your identity, such as using a pseudonym instead of your name and keeping all information on a password protected computer and locked in a file drawer.

WHAT POSSIBLE BENEFITS CAN I EXPECT FROM TAKING PART IN THIS STUDY?

There is no direct benefit to you for participating in this study. Participation may benefit the field of music education to better understand and attend to musical behaviors of infants.

WILL I BE PAID FOR BEING IN THIS STUDY?

You will not be paid to participate.

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WHEN IS THE STUDY OVER? CAN I LEAVE THE STUDY BEFORE IT ENDS?

The study is over when you have completed the interview (s) and the teacher diary entries. However, you can leave the study at any time even if you haven't finished.

PROTECTION OF YOUR CONFIDENTIALITY

The investigator will keep all written materials locked in a desk drawer in a locked office. Any electronic or digital information (including audio recordings) will be stored on a computer that is password protected. What is on the audio-recording will be written down and the audio-recording will then be destroyed. There will be no record matching your real name with your pseudonym. Regulations require that research data be kept for at least three years.

HOW WILL THE RESULTS BE USED?

The results of this study will be published in journals and presented at academic conferences. Your name or any identifying information about you will not be published. This study is being conducted as part of the dissertation of the principal investigator.

CONSENT FOR AUDIO RECORDING

Audio recording is part of this research study. You can choose whether to give permission to be recorded. If you decide that you don't wish to be recorded, you will still be able to participate in this study.

____ I give my consent to be recorded _____

Signature

____ I do not consent to be recorded _____

Signature

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--

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New York NY 10027
212 678 3000

INFORMED CONSENT

WHO MAY VIEW MY PARTICIPATION IN THIS STUDY

__ I consent to allow written, video and/or audio taped materials viewed at an educational setting or at a conference outside of Teachers College _____
Signature

__ I do not consent to allow written, video and/or audio taped materials viewed outside of Teachers College Columbia University _____
Signature

OPTIONAL CONSENT FOR FUTURE CONTACT

The investigator may wish to contact you in the future. Please initial the appropriate statements to indicate whether or not you give permission for future contact.

I give permission to be contacted in the future for research purposes:

Yes _____ No _____
Initial Initial

I give permission to be contacted in the future for information relating to this study:

Yes _____ No _____
Initial Initial

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Institutional Review Board
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New York NY 10027
212 678 3000

INFORMED CONSENT

WHO CAN ANSWER MY QUESTIONS ABOUT THIS STUDY?

If you have any questions about taking part in this research study, you should contact the principal investigator, Nita Baxani at 917-275-4080 or at ncb2129@tc.edu.

If you have questions or concerns about your rights as a research subject, you should contact the Institutional Review Board (IRB) (the human research ethics committee) at 212-678-4105 or email IRB@tc.edu. Or you can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY 1002. The IRB is the committee that oversees human research protection for Teachers College, Columbia University.

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INFORMED CONSENT

PARTICIPANT'S RIGHTS

- I have read and discussed the informed consent with the researcher. I have had ample opportunity to ask questions about the purposes, procedures, risks and benefits regarding this research study.
- I understand that my participation is voluntary. I may refuse to participate or withdraw participation at any time without penalty.
- The researcher may withdraw me from the research at his or her professional discretion.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue my participation, the investigator will provide this information to me.
- Any information derived from the research study that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- I should receive a copy of the Informed Consent document.

My signature means that I agree to participate in this study

Print name: _____ **Date:** _____

Signature: _____

<p>Teachers College, Columbia University Institutional Review Board</p> <p>Protocol Number: 17-135 Consent Form Approved Until: 01/12/2018</p>
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Appendix J – Informed Consent for Parents

Teachers College, Columbia University
525 West 120th Street
New York NY 10027
212 678 3000

INFORMED CONSENT

Protocol Title: Examining the Functions of Infant Musicality Within a Daycare Community

Parent Interview Consent

Principal Investigator: Nita Baxani, Teachers College, 917-275-4080

INTRODUCTION

You are being invited to participate in this research study called "Examining the Functions of Infant Musicality Within a Daycare Community." You may qualify to take part in this research study because you are a parent of an infant in a university affiliated early childhood center. Approximately 18 people will participate in this study and it will take 3-4 hours of your time to complete.

WHY IS THIS STUDY BEING DONE?

This study is being done to determine the functions of musical behaviors in infants. Research in the area is limited and it is my hope that through this study, we can learn more about how infant musical behaviors are present in the daycare and home settings.

WHAT WILL I BE ASKED TO DO IF I AGREE TO TAKE PART IN THIS STUDY?

If you decide to participate, you will be interviewed by the principal investigator. Your participation will involve one face-to-face interview with the researcher in the infant's home environment regarding your perspectives of infant musical behaviors outside of the infant room. This interview will be audio-recorded. After the audio-recording is written down the audio-recording will be deleted. If you do not wish to be audio-recorded, you will be able to participate, and the principal investigator will take notes by hand during the interview. The interview will take approximately thirty to sixty minutes. You will be given a pseudonym in order to keep your identity confidential.

In addition to interviewing, I will be observing your child in the infant classroom on a weekly basis. I will be taking notes, as I observe the interactions of infants with their peers and caregivers. As the music instructor of the infant room, I will also video-tape these thirty minute lessons as part of my teaching practice, as has been done in the past and for identifying musical behaviors for this study.

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Protocol Number: 17-135
Consent Form Approved Until: 01/12/2018

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212 678 3000

INFORMED CONSENT

Finally, you will be asked to record musical behaviors into a parent diary template. This will take place during three separate weeks throughout the duration of this study, after the interview, and spaced out throughout the spring term. These entries can be sent to me as a written or audio file by email or text message.

WHAT POSSIBLE RISKS OR DISCOMFORTS CAN I EXPECT FROM TAKING PART IN THIS STUDY?

I do not anticipate any risks to you participating other than those encountered in day-to-day life. Your participation in this study is voluntary, and all names will not be disclosed. You may choose to withdraw from the study at any time.

The principal investigator is taking precautions to keep your information confidential and prevent anyone from discovering or guessing your identity, such as using a pseudonym instead of your name and keeping all information on a password protected computer and locked in a file drawer.

WHAT POSSIBLE BENEFITS CAN I EXPECT FROM TAKING PART IN THIS STUDY?

There is no direct benefit to you for participating in this study. Participation may benefit the field of music education to better understand and attend to musical behaviors of infants.

WILL I BE PAID FOR BEING IN THIS STUDY?

You will not be paid to participate.

WHEN IS THE STUDY OVER? CAN I LEAVE THE STUDY BEFORE IT ENDS?

The study is over when you have completed the interview and the parent diary entries. However, you can leave the study at any time even if you haven't finished.

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 212 678 3000

INFORMED CONSENT

PROTECTION OF YOUR CONFIDENTIALITY

The investigator will keep all written materials locked in a desk drawer in a locked office. Any electronic or digital information (including audio recordings) will be stored on a computer that is password protected. What is on the audio-recording will be written down and the audio-recording will then be destroyed. There will be no record matching your real name with your pseudonym. Regulations require that research data be kept for at least three years.

HOW WILL THE RESULTS BE USED?

The results of this study will be published in journals and presented at academic conferences. Your name or any identifying information about you will not be published. This study is being conducted as part of the dissertation of the principal investigator.

CONSENT FOR AUDIO RECORDING

Audio recording is part of this research study. You can choose whether to give permission to be recorded. If you decide that you don't wish to be recorded, you will still be able to participate in this study.

_____ I give my consent to be recorded _____

Signature

_____ I do not consent to be recorded _____

Signature

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WHO CAN ANSWER MY QUESTIONS ABOUT THIS STUDY?

If you have any questions about taking part in this research study, you should contact the principal investigator, Nita Baxani at 917-275-4080 or at ncb2129@tc.edu.

If you have questions or concerns about your rights as a research subject, you should contact the Institutional Review Board (IRB) (the human research ethics committee) at 212-678-4105 or email IRB@tc.edu. Or you can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY 1002. The IRB is the committee that oversees human research protection for Teachers College, Columbia University.

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 525 West 120th Street
 New York NY 10027
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INFORMED CONSENT

PARTICIPANT'S RIGHTS

- I have read and discussed the informed consent with the researcher. I have had ample opportunity to ask questions about the purposes, procedures, risks and benefits regarding this research study.
- I understand that my participation is voluntary. I may refuse to participate or withdraw participation at any time without penalty.
- The researcher may withdraw me from the research at his or her professional discretion.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue my participation, the investigator will provide this information to me.
- Any information derived from the research study that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- I should receive a copy of the Informed Consent document.

My signature means that I agree to participate and give permission for my infant to be observed and recorded in this study

Print name: _____ **Date:** _____

Signature: _____

Child's name: _____

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Appendix K – Episode Guide: Functions

Accompanying Imaginative Play: Music is used to create sound effects for stories or events, or to make a pretend object sound like it is real. Focus is on the story or object (Custodero et al., 2016).

Accompanying Motor Activity: Music is used to reinforce rhythms of body movement and gestures. Focus is on the kinesthetic (Custodero et al., 2016).

- Transition: accompanies movement; to motivate self; being moved

Comfort/Entertain Self: Music is used in an intimate, private way, directed inward. Focus is on the self (Custodero et al., 2016).

- Pre-sleep vocalizations are a way to self-soothe, reflect privately, and to transition from being together to being alone (Sole, 2016)
- Self-regulation; recollecting emotions, music can be used for other kinds of memory work, such as bringing back relationships, events, or a particular time; recalling and processing experiences (Karlsen, 2011)
- Imaginary friend providing comfort and protection, amorphous, fluid, introspective (Bjorkvold, 1990; Bjorkvold, 1992)
- Solitary; less metric, more reflective (Custodero et al., 2016)

Communicate with Others: Music is used to engage with others and involves child initiation or response to others' invitation to make music. Focus is on interactions (Custodero et al., 2016).

- Emotional sharing; conversing emotionally; bonding, expressing emotion (Dissanayake, 2000b; Malloch & Trevarthen, 2009)
- Verbal communications turn musical (rhythmic/melodic); integration of society (Campbell, 2000)

Explore

- Child created sound shapes/delight in sound making (Pond, 1980)
- Continuous vocals (sounds) when no interactions involved/could be self-regulation however there is something about the auditory feedback (Shimada, 2012)
- Purposeful exploration of sounds (intentional, independent, imaginative) (Littleton, 1998)
- Experimenting vocally, developing and practicing singing skill, understanding people, events, or ideas (Sole, 2016)

Other

- Undetermined (insufficient information/context in the episode)
- Combination Codes (happening simultaneously)

Appendix L – Coding Scheme and Example of Coding by Episode

Behaviors		
Vocal	V	1
Movement	M	2
Instrument Play	IP	3
Listening	L	4

Setting		
Home	1	H
School	2	S
Field Obs	3	FO
Class	4	CL

Initiation		
Child	1	C
Adult	2	A
Peer	3	P
Undetermined	4	U

Functions	
COMF	1
COMM	2
EXPL	3
IMAGPLAY	4
MOTOR	5
UNDET	6
CFE	7
CME	8
CEP	9
CFCM	10

Ep #	Age	Behavior				Function				Initiation				Setting			
		1	2	3	4	1	2	3	4	1	2	3	4	H	S	FO	CL
A1	11	IP				Comm				U				x			
A2	11	L				Comf				A				x			
A3	11	L				Undet				C				x			
A4	11	IP	M	V		Comf	Comf	CME		C				x			
A5	11	M				Comm				A				x			

Ep #	Age	Behavior				Function				Initiation				Setting			
		1	2	3	4	1	2	3	4	1	2	3	4	H	S	FO	CL
A1	11	3				2				4				1			
A2	11	4				1				2				1			
A3	11	4				6				1				1			
A4	11	3	2	1		1	1	8		1	1	1		1	1	1	
A5	11	2				2				2				1			

Appendix M – Photos of Artifacts



Cyndi's Firebunny



The Infant Room Tiger Piano



Frederic's Karaoke Machine



Old MacDonald Book (Infant Room)