A Music Therapy Program Addressing Language Development with Children on the Autism Spectrum

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ABSTRACT

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Autism Spectrum Disorder is currently recognized as a neurological disorder characterized by impairments in communication, socialization, restricted movements, and language development. The purpose of this study was to design a program that utilized song-based music therapy interventions to address language development as part of a collaboration with a speech-language pathologist for children with autism spectrum disorder (ASD). Through the analysis of current music therapy, speech-language pathology, and psychology literature, five malleable mediators were identified as having the potential to affect language development for children with ASD: (a) to develop a safe and trusting relationship with the therapist; (b) to develop imitation skills; (c) to improve turn-taking skills; (d) to develop understanding of words using the augmentative communication tools; and (e) to increase vocalization and/or verbalization. Those malleable mediators were paired with action strategies, which were identified from the literature and from the author's clinical experience. A weekly goal-oriented music therapy intervention program was developed to address language development with children on the ASD, consisting of approximately 16 weekly 30-minute sessions divided into eight blocks. The child would progress from one block of sessions to the next once the necessary skills had been acquired. This design with target words or phrases incorporated into songs using visual materials can be used in music therapy clinical intervention contexts and can also form the basis for further research.

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DEDICATION

I dedicate this thesis to my parents.

To a strong and gentle mother, who always believes in me and supports my challenges.

To my father, who always protected me and now looks at me from heaven with a big smile.

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Chapter 1. Introduction

Autism Spectrum Disorder (ASD) is currently recognized as a neurological disorder characterized by impairments in communication, socialization, restricted movements, and language development (American Psychiatric Association [APA], 2013). Even though children with ASD show some similar symptoms, each individual exhibits symptoms in different ways (Center for Disease Control and Prevention [CDC], 2012). Autism Speaks Canada (2013) reported that one in 88 children had been diagnosed with autism in 2012 and that it is four times more prevalent in males than in females.

Symptoms of ASD can gradually occur within a child's first 2 years; however, some children follow characteristic developmental milestones before suddenly regressing just prior to the age of 3 years (National Institute of Neurological Disorders and Stroke [NINDS], 2013). Even though there is no known cure for people with ASD, and most require services and support throughout their lives, many of the children with ASD can show improvement in their symptoms with treatment and age (Autism Speaks Canada, 2013; Lim, 2012a; NINDS, 2013), and some research has suggested that early intervention treatment is crucially important for these children's development (Aldridge, 2012; APA, 2013; CDC, 2012; Clarkson, 2009; Kern, 2012).

Some of the most common deficits for children with ASD are related to speech and language skills (Fitzer & Sturmey, 2009; Heiderscheit, 2009; Lim, 2012a, 2012b; Wigram & Gold 2006). As a result of language delays, some people with ASD may behave aggressively (Kern, Wakeford & Aldridge, 2007; Sousa, 2001). According to Duffy (2007), some of the aggressive behaviors exhibited by children with learning impairments may due to issues related to brain function. Thaut (2005) noted that research suggests that music has a deep

ingrained function in the brain, and a number of researchers have studied the effect of sound and music on brain chemistry (Crowe, 2004).

Some collaboration between music therapy and speech-language pathology (SLP) has been reported (Bruscia, 1982; Register, 2002; Smith, 2011). Currently however, there is a lack of specific music therapy research regarding approaches using songs and picture cards to facilitate language skills development of children with ASD.

Statement of Purpose

Current literature suggests that the use of music can positively impact the development of language skills in children with ASD (Bruscia, 1982; Kern, 2012; Lim, 2012a, 2012b; Wigram & Gold, 2006). Assessment to determine the target words or phrases for each child's needs is crucial for more positive outcomes (Kern, 2012; Lim, 2012a, 2012b). Through work with other allied professionals it may become possible for music therapists to share knowledge and information, such as identifying words and utilizing Augmentative and Alternative Communication (AAC) systems. These target words or phrases can then be embedded into a song that a music therapist can use as part of an intervention for developing language and communication skills. Thus, the purpose of this research is to design a music therapy intervention program that utilizes songs to address language development as part of a collaborative effort with speech-language pathologists for treating children with ASD.

Research Questions

The primary research question for this study is: "What is an appropriate design for a music therapy program that utilizes songs to address language development for children with ASD?" The subsidiary research questions are: "What are the particular elements of music that help children with ASD to develop speech?"; "What are the related techniques that help

children with ASD to develop speech?"; and "What are the key elements that allow a music therapist to effectively collaborate with a speech-language pathologist?"

Operational Definitions

Language development was defined by APA Dictionary of Psychology (VandenBos, 2007) as "the process by which children learn to use language" (p.522).

The NINDS defined *ASD* as "a range of complex neurodevelopment disorders, characterized by social impairments, communication difficulties, and restricted, repetitive, and stereotyped patterns of behavior" (2013, para.1).

Assumptions and Biases

In designing this study, I assume that music therapy is particularly beneficial to children with ASD. I also assume that embedding target words or phrases into songs, in conjunction with the use of visual material, may facilitate communication skills for children with language impairments. Finally, I assume that collaboration between music therapy and SLP is an effective approach for providing treatment and services to children with language deficits. Therefore my overarching assumption in this study is that the combination of developmental speech and language training through music (Lim, 2012b), other therapists' techniques, and collaboration with a speech-language pathologist can address the acquisition of target words while improving the communication skills of children with ASD.

Delimitations

This research is delimited to examining literature and designing a program for the specific population of children between 2 to 5 years of age with ASD as defined by the Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; DSM-IV-TR; APA, 1994). Another delimitation for this research is that it only encompasses the first and a part of

the second of Fraser and Galinsky's (2010) intervention research method due to the limited time available to complete the researcher. The first step of the model is to "develop problem and program theories" (Fraser and Galinsky, 2010, p.463), and the second step of the model is to "specify program structures and processes" (Fraser and Galinsky, 2010, p.463).

Overview of Chapters

The following chapter examines the nature of ASD. The existing psychology, music therapy, and SLP literature addressing language development with children with ASD is also reviewed. Chapter 3 describes the methodology of intervention research design. Chapter 4 presents the results of this study including a protocol and detailed interventions. Lastly, in Chapter 5 the findings are discussed and interpreted, recommendations are made, and suggestions for future research are provided.

Chapter 2: Literature Review

This chapter begins by describing the prevalence of ASD as well as social interaction and communication issues for children with ASD. Next, the role of AAC Systems in ASD will be reviewed followed by a review of the use of music for children with language deficits and ASD. Subsequently, the collaboration between music therapy and SLP will be considered followed by the use of music therapy with children with ASD.

Autism Spectrum Disorder

Prevalence and diagnosis. ASD is a pervasive developmental disorder that encompasses variable and complex neurodevelopment disorders (NINDS, 2013). In recent years, the number of children diagnosed with ASD has been increasing dramatically (Heiderscheit, 2009). U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics (2013) reported that in the United States, 20 in 1,000 children were diagnosed with ASD in 2012, which was up from 11 in 1,000 children in 2008 (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2012). Autism Speaks Canada (2013) reported that one in 88 children was diagnosed with autism in 2012. Overall, boys are four to five times more likely to be diagnosed with ASD than girls, as reported in the United States and Canada.

The symptoms of ASD appear during the first 3 years of life, and research has indicated that ASD can be reliably diagnosed by the age of 2 (CDC, 2010). However, in reality, most children with ASD are diagnosed after 4 years of age (CDC, 2013). Currently there are no medical diagnostic tests, such as biological marker tests, for diagnosing ASD; however, a doctor's diagnosis of ASD is made through two steps of diagnosis, which include developmental screening and a comprehensive evaluation. This is completed by observation

of the child's development and behaviour, and an interview with the child's parents using the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) criteria (CDC, 2010; Kern, 2012; Lord & Bishop, 2010). In some cases, a doctor may send a child to a multidisciplinary team which typically includes: psychologists, psychiatrists, neurologists, speech therapists and others specialists who can diagnose children with ASD (NINDS, 2013). Early intervention and treatment can affect and improve the symptoms of ASD even though the medical literature does not report any cure for ASD at this moment (APA, 2013; CDC, 2012; Clarkson, 2009; Lim, 2012b).

Social interaction and Communication in Autism Spectrum Disorder

ASD is a complex disorder and each child with ASD has a different collection of features within the spectrum (Parenting and Child Health, 2013). However, ASD has three core characteristics: difficulties with communication and language, difficulties with social interaction, and maladaptive behaviours including repetitive, restricted, and/or stereotyped behaviours (Kern, 2012; Lim, 2012a, 2012b). It is often difficult for children with ASD to relate and engage with others (NINDS, 2013). The absence of social competence in relation to aspects such as facial expressions, body language, and eye movements following and responding to others can result in children with ASD isolating themselves and acting passively in a classroom setting (Fitzer & Sturmey, 2009; Kern, 2012).

Communication competence is defined as communicating one's needs and understanding the needs of others by using both receptive and expressive language skills (Kern, 2012). Language abilities in children with ASD range from nonverbal to competent communication skills; however, most children with ASD require some level of support to further develop their communication skills (Kern, 2012; Lim, 2012a, 2012b). Children with

ASD can experience difficulty with unclear or indirect expressive communication from others such as verbal instructions, responding and asking questions, humour, idioms, and metaphors (Kern, 2012; Sussman, 1999). Frequently, echolalia, which is the repetition the words or phrases, is seen as a symptom of ASD (Kern, 2012; Lim, 2012a, 2012b; Sussman 1999). Even though outcomes vary individually, effective interventions to develop language skills and to improve social communication skills are among the most important treatment goals for children with ASD (Lim, 2012b; Meadan, Hall & Kelly, 2012).

Augmentative and Alternative Communication Systems and Picture Exchange Communication System in Autism Spectrum Disorder

Augmentative and Alternative Communication (AAC) is defined as:

> A set of tools and strategies that an individual uses to solve everyday communicative challenges. Communication can take many forms such as:
>
> speech, a shared glance, text, gestures, facial expressions, touch, sign language, symbols, pictures, speech generating devices, etc. (The International Society for Augmentative and Alternative Communication, 2013, para.1).

Current research suggests that AAC offers an adapted form of communication, thus it is useful in assisting those individuals with limited language and speech skills (Gadberry, 2011). AAC can be described as either aided or unaided. Aided AAC involves the use of pictures or electronic systems with speech output, and unaided AAC involves the use of gestures, pointing, and sign language (Gadberry, 2011). Some studies have suggested that children with ASD respond and progress well with visual stimuli such as those used in aided AAC (Humpal & Kern, 2012; Lim, 2012b).

The National Professional Development Center on Autism Spectrum Disorders (NPDC on ASD) noted that the Picture Exchange Communication System (PECS) was originally developed for young children with ASD to communicate in certain social contexts (NPDC on ASD, 2013). However, PECS is currently being used with people of many different ages and diagnoses to address individual communication needs (NPDC on ASD, 2013).

PECS uses picture cards to help people with communication or language difficulties to learn how to communicate with others (NPDC on ASD, 2013). In PECS, the person exchanges a card to receive a desired item. There are several different phases to PECS, and the level of physical assistance is gradually phased out as each phase is mastered. In the later phases, participants begin to build and initiate sentence structures (NPDC on ASD, 2013). This system is now used in multiple settings including schools, homes, and therapy settings (NPDC on ASD, 2013). However, there is a need for more research to help music therapists gain a better understanding of the processes pertaining to the use of AAC systems in children with ASD in music therapy sessions (Gadberry, 2011).

Language Deficits and Music

There are many similarities between speech and music. According to Lim (2012a, 2012b), children with ASD who have an ability to produce speech sounds such as echolalia are considered capable of "Gestalt language acquisition" (Lim, 2012 b, p.205). Children with ASD may not understand each word, however they are able to perceive and produce patterns of words or phrases, and utter them as unified phrases (Lim, 2012a, 2012b).

Lim noted that music is formed by the production of the elements in a pattern or arrangement that is similar to the "Gestalt laws of perception" (2012b, p. 205). Berger (2002) described the six basic elements of music as "rhythm, melody, harmony, dynamics, timbre,

and form" (p.112). These elements of music are conjectured to regulate and/or stimulate a person's physical and mental functioning because music has "no semantic translations" (Berger, 2009, p. 178).

Many researchers have indicated that certain aspects of music may positively affect language development, and social and communication skills (Braithwaite & Sigafoos, 1998; Buday, 1995; Demaine, 2009; Edgerton, 1994; Heiderscheit, 2009). Music is a useful tool when working with speech disorders (Lim, 2012a). The rhythm of a song provides appropriate pacing, and the repetition of lyrics can provide opportunities for practice which reinforces learning experiences (Heiderscheit, 2009).

Lim's (2012a) study described the effect of music therapy interventions on developing language skills for vocabulary acquisition and speech production with 50 preschool-aged children between three and five years old with ASD. The study was designed to compare videos of three different groups: a music group, a speech group, and a control group. Both videos contained 36 target words, with the words being sung in the video for the music group, and spoken in the speech group video. Gestalt laws of perception were utilized in the composition of all the songs. Before and after all six treatments, two speech language pathologists took data on the number of words spoken. The verbal production evaluation scale (VPES), which was designed during the experiment, was used for analyzing the data. The study reported a significant improvement of speech production (Lim, 2012a). For these children with ASD, listening to both music and speech increased their verbal production. It was further discovered that those participants who were more challenged in functioning showed greater improvement when listening to music than when listening to speech.

Hoskins (1988) found language improvement in preschoolers with language difficulties using antiphonal singing paired with picture cards. Kolko, Anderson, and Campbell (1980) suggested that most children with ASD are more likely pay attention to auditory musical stimuli rather than to visual stimuli. Music can also function as a form of automatic reinforcement to increase attention span (Heiderscheit, 2009).

Music and Song with Children who have Autism Spectrum Disorder

Several studies described a positive response to music in children with ASD. Braithwaite and Sigafoos's (1998) quantitative research study suggested that a musical antecedent condition effectively prompted and reinforced some of the children's verbal responses, and as a result, the children who participated in the music interventions increased their communication skills. Edgarton's (1994) research with improvisational music suggested that children with ASD increased communicative behaviours.

Music contains various levels of structure, while also providing flexibility, as opposed to the more rigid characteristics of ASD (Wigram, & Gold, 2006). Demaine (2009) suggested that children with ASD show positive responses to either melody or rhythm. When children with ASD have positive experiences, they engage in positive communication. Children with ASD show the ability of pattern perception and production and the tendency of following the Gestalt style of language acquisition, which is based on the pattern perception (Lim, 2012b).

Music consists of pattern perception and production, and these abilities are frequently seen in children with ASD (Lim, 2012a). Music connects with children with ASD as they can imitate the language and melody present in a song (Demaine, 2009). Structured,

anticipated progressions and repetitive patterns of music can also be easily recalled by children with ASD (Buday, 1995).

Singing is a sound produced by the voice which includes both tonality and rhythm. Kern, Wakeford, and Aldridge (2007) completed a case study that used songs which included embedded multi-step self-care tasks within the lyrics for a child with language impairment associated with an ASD diagnosis. Their study was designed to compare musical versus verbal interventions for classroom routines with a 3-year-old child with ASD. Both interventions used the same words and directions. For the musical intervention, three songs were examined: a familiar tune for hand-washing, a pre-composed tune for cleaning up, and a newly-composed tune for toileting. The results suggested that both the song and speech interventions were beneficial in increasing the child's performance in basic self-care tasks; however, the songs were more effective than use of speech for the child (Kern, Wakeford & Aldridge, 2007). It was suggested that songs can more easily transmit routine information, such as structural prompts, which can help the child complete the tasks independently. The findings of this case study also indicated that a familiar tune was more effective for learning than an unfamiliar tune (Kern, Wakeford & Aldridge, 2007). The familiar tune may motivate the child especially during more challenging tasks (Kern, Wakeford & Aldridge, 2007).

In contrast, Lim (2012a) recommended limiting the familiarity and complexity of songs used for children with language impairments related to ASD, as songs with too much complexity or familiarity would not effectively capture the children's attention. Lim (2012a) suggested that for children with language impairment related to ASD, music therapists could compose a clinical song which was simple, structured, limited in pitch range, and with a repetitive melody. It was also recommended that the simplicity of the song would help a child

to sing and memorize more easily, which would help to further develop a child's language skills.

Collaboration between Music Therapy and Speech Language Pathology

Children with ASD are varied and complex, therefore a multidisciplinary approach could yield more effective outcomes for their daily life, including the development of speech and language skills. The American Speech-Language Hearing Association indicated that speech-language pathologists "evaluate and diagnose speech, language, cognitive-communication, and swallowing disorders and treat such disorders in individuals of all ages, from infants to the elderly" (2013, para.1). Speech-language pathologists educate and support teachers, caregivers, and family members on the most effective use of AAC systems techniques with children with ASD.

Lim (2012a, 2012b) advocated for a combined approach of music therapy with SLP to target selected words and phrases while playing carefully selected music to support each individual's needs. In Buday's (1995) research, 10 local public school children with a special program for ASD were taught a total of 14 songs in two groups: one using music paired with speech, and one using rhythm paired with speech. The result of the ANOVA statistical analyses found that children with ASD significantly increased their use of sign language when music paired with speech was used, rather than only rhythm paired with speech. A case study described by Bruscia (1982) illustrated the collaboration between a music therapist and speech-language pathologist in which a 14-year-old male's echolalia was successfully reduced from 95% to less than 10% in a variety of settings through the use of both music therapy and SLP techniques.

A comprehensive evaluation of the language development of the children with ASD by both music therapy and SLP professionals could enhance the quality of music therapy clinical practice with this population. Although collaboration between music therapists and speech-language pathologists has been reported, there is still a lack of music therapy research which specifically investigates the possible benefits of combining music therapy and SLP techniques. Register's (2002) survey showed that 44.6% of the 695 music therapists surveyed had collaborated with speech language pathologists. Smith (2011) noted that this multidisciplinary collaboration was beneficial for the clients, cost effective, and accessible due to the similar structure of music and language; however, Smith also stated that the cons of music therapy and SLP collaborations include time-consuming preparation, inefficient use of time, lack of knowledge about each-others' field, differences of perspective and perception, unclear role assignment, and possible professional competition. In some cases the professional competition may negatively impact the collaboration and general therapeutic efficiency for the clients (Smith, 2011).

Music Therapy Interventions for Children with Autism Spectrum Disorder

Music therapists have been working with children with ASD since the 1940s. Prior to 1940, children were often diagnosed with schizophrenia, psychosis, or mental retardation. This occurred up until the 1980s when ASD was added to the DSM-III-R (Reschke-Hernandez, 2011). Even though music therapists have endeavoured to enhance their treatment approach for people with ASD, they received criticism in the 1990s because of a lack of strong evidence-based support for the benefits of music therapy with children with ASD (Reschke-Hernandez, 2011). Since 2000, there has been an emphasis on improving music

therapy's clinical research in hopes of wider recognition regarding music therapy as a valid therapy for ASD (Reschke-Hernandez, 2011).

Music therapy uses music for specific purposes, and integrates well with a wide range of special education goal areas including speech, language, physical, educational, psychological, social, and aesthetic objectives (Pellitteri, 2000). Wigram and Gold (2006) suggested that music therapy works for children with ASD because it is flexible, creative, variable, and adaptable to the individual's needs. A wide range of responses to music therapy for children with ASD have been reported by parents, caregivers, researchers, and other professionals (Lim, 2012a). These responses have included increased attention, motivation to participate in musical stimuli, and further development of functioning (Lim, 2012a).

Music therapy interventions can address the social, emotional, cognitive, psychological and physical needs of many individuals, and it has been suggested that flexible and structured improvisational music attracts the attention and elicits engagement in children with ASD **(**Edgerton, 1994; Heiderscheit, 2009). It has been noted that children with impulsive behavior tend to have disorganized beats; however, when they acquire an internalized sense of regular rhythm through music, these children start to develop an organized structure and order (Nordoff & Robbins, 1983).

According to the American Music Therapy Association, "quality learning and maximum participation occur when children are permitted to experience the joy of play. The medium of music therapy allows this play to occur naturally and frequently" (2006, para.3). A structured session with familiar music and songs provides a safe and predictable environment, and provides children with ASD with a sense of comfort and relaxation, which reduces fear, agitation, anxiety, and behavioral difficulties (Heiderscheit, 2009). The individuals can remain

engaged longer and are motivated to continue their participation in music therapy sessions (Heiderscheit, 2009).

Summary

ASD is a neural developmental disorder that is characterized by impairments in social interaction and communication skills (APA, 2013). Music therapy addresses the client's needs and difficulties through music, and several studies have found that children with ASD respond positively to music therapy interventions (Bruscia, 1982; Edgerton, 1994; Heiderscheit, 2009; Lim, 2012a, 2012b; Pellitteri, 2000; Wigram and Gold, 2006). AAC can be used for children with ASD in the form of visual communication tools. A multi-disciplinary approach such as music therapy and SLP has been suggested to potentially promote meaningful, effective outcomes in children with ASD. However, little has been written about the use of aided AAC or a collaborative model for music therapy and SLP.

Chapter 3: Methodology

Philosophy and Theory of Science

My philosophy of science is primarily post-positivistic. Post-positivists accept what is observed through the view of theories, background, knowledge, and values of the researcher (Robson, 2002). In my professional experience as music therapist, I found it important to have a good understanding of language development of children with ASD. Therefore this is the guiding philosophy of this study.

Design

The method for this research is an intervention design. Fraser and Galinsky (2010) defined intervention research as:

> The design of an intervention often involves delineating a problem theory in which potentially malleable risk factors are identified and then in program theory matching these risk factors—sometimes conceptualized as mediators—with change strategies, such as the provision of psychoeducation. The internal logic of an intervention can be assessed as the extent to which malleable risk factors are paired with change strategies of sufficient strength to produce positive outcomes (p.460).

This design was developed using the first two steps of Fraser and Galinsky's (2010) five-step model of intervention research. The first step of the model worked to "develop problem and program theories" (Fraser & Galinsky, 2010, p.463). In this step, the problem was identified, a program theory was developed, and malleable mediators and action strategies were determined while considering how to approach the problem. The second step was to "specify program structures and processes" (Fraser & Galinsky, 2010, p. 463). In this step, the classified knowledge from the literature was synthesized and an initial intervention protocol

was developed. This protocol described in detail each intervention including intervention goals, essential content, and an intervention plan (Fraser & Galinsky, 2010). This research study was concluded at this stage of the process.

The intervention research was designed to answer the research question through the creation of a music therapy intervention program grounded in the literature, and established knowledge of specific clinical implications and music therapy intervention protocols.

Data Collection

Data were gathered from music therapy, psychology, SLP, and scientific literature relating to the research question: "What is an appropriate design for a music therapy program that utilizes songs for children with ASD?" Database searches were completed on Psych-Info, Medline, SAGE Journals, The American Journal of Psychiatry, ProQuest, and Google Scholar. Music therapy journals that were searched included the Canadian Journal of Music Therapy, Journal of Music Therapy, Nordic Journal of Music Therapy, British Journal of Music Therapy, Music Therapy Perspectives, and Voices. Books were searched through the Concordia University CLUES library system. All the literature collected was categorized into seven categories: ASD, social communication in ASD, the role of AAC systems, language deficits and music, music and children with ASD, collaboration with music therapy and SLP, and music therapy for children with ASD.

Data Analysis

Qualitative analysis coding methods were used to organize the data. Open coding was used for identifying initial themes, and axial coding was used for selecting codes from the initial broader themes to identify particular selections of data (Marshall & Rossman, 2012).

Step 1: Developing problem and program theories. The problem was identified during the process of open coding, and was refined during the process of axial coding. Program theories were developed from the data that were identified through the process of open and axial coding. Malleable mediators were defined to address language impairments through music therapy, SLP, and psychology literature. These malleable mediators were paired with action strategies that were based on the literature and the researcher's clinical experience.

Step 2: Program structures and processes. The intervention protocol was designed throughout the process of step one. Each intervention was described by identifying goals, essential content, and intervention plans.

Chapter 4: Results

The following music therapy singing intervention program was designed utilizing step 1and a part of step 2 of Fraser and Galinsky's (2010) intervention model to address language development for children with ASD.

Step 1: Development of Problem and Program Theories

Identification of the problem. Four elements of the problem were identified regarding children with ASD. First, boys are approximately four times more likely to be diagnosed with ASD than girls, and the number of children being diagnosed with ASD is increasing (CDC, 2013). Second, children can be diagnosed before 3 years of age, but many children with ASD are being diagnosed after 4 years of age in the United States (CDC, 2013). Third, despite the fact that symptomology varies widely between individual cases of children with ASD, communication, socialization, and motor skills are the three major features for all children with ASD (CDC, 2013; Lim, 2012a, 2012b; Sussman, 1999). Lastly, some of the children diagnosed with ASD are nonverbal or have serious language difficulties, but, with assistance, some children are able to develop adequate communication skills (Lim, 2012a; Sousa, 2001).

Program theories.

The central theory of this program is based on the premise that music therapy is an effective intervention to facilitate and enhance language development in children with language impairments (Reschke-Hernandez, 2011; Thaut, 2005; Wigram & Gold, 2006). Among other benefits, collaboration with a speech language pathologist as a part of music therapy program would be advantageous in fostering language skill development in children with ASD (Bruscia, 1982; Lim, 2012a, 2012b; Smith, 2011).

Malleable mediators.

Language. After an analysis of current literature, which was then combined with the researcher's clinical experiences working with children with ASD, language was identified as a malleable mediator and its action strategies were established within the intervention design.

Expressive language is defined as how a person utilizes language to express his or her needs, which includes, but is not limited to, responding to and asking questions, using gestures, facial expressions, making eye contact, and using body language (Kern, 2012). Receptive language is defined as a person's understanding of language, including non-verbal communication, following directions, and identifying objects (Parenting and Child Health, 2013).

To develop language skills in children with language impairments with ASD, five malleable mediators were identified:

1. To develop interaction.
2. To develop imitation skills.
3. To develop turn-taking skills.
4. To develop understanding of words using the augmentative communication tools.
5. To develop or increase vocalizations and/or verbalizations.

Action Strategies.

1. To develop interaction. The music therapist will provide a safe and supportive environment for the child. Through the music therapist's use of each child's favorite music or musical instruments in a one-on-one session format, the child will feel safe and comfortable enough to participate in the music therapy session. This may also encourage the child to better

pay attention to the music therapist. The music therapist will develop a therapeutic rapport with the child through the creation of a trusting relationship.

2. To develop imitation skills. Echolalia is a prominent feature in children with ASD. Occurring in two forms, *immediate echolalia* is when words and phrases are repeated right after hearing them, and *delayed echolalia* is when words or phrases are repeated a day to a year after they are initially heard (Bruscia, 1982; Sussman, 1999). When a child demonstrates echoic skills, the music therapist will utilize this skill in sessions to the child's advantage. For instance, the music therapist will place target words at the end of each phrase to encourage the child to repeat and practice the desired words.

3. To develop turn-taking skills. Taking turns is "one of the fundamental elements of conversation" (Lim, 2012a, p. 90). Within the context of this intervention, the music therapist will cue the children in regards to taking their turn. If necessary, the therapist will touch the child gently to provide a physical cue for the child to take his or her turn during a given exercise. The therapist would do so by gently touching the child's hand, arm, or shoulder while calling his or her name as a means of cuing the child's turn.

4. To develop understanding of words using the augmentative communication tools. The child will be encouraged to look at picture cards during the music therapy sessions that will depict target words, phrases, or objects such as musical instruments. The music therapist will utilize the picture cards to help the child to understand what words the therapist is cuing.

5. To develop or increase vocalizations and/or verbalizations. The child will be encouraged to develop or increase his or her vocalizations and/or verbalizations through the use of familiar or simple songs that include target words and/or phrases that are embedded.

The target words or phrases will be chosen in collaboration between a speech language pathologist and music therapist based on the assessment of the child.

Step 2: Program Structures and Processes

Through the use of greetings, musical instruments, movement, and songs, the structural and functional protocols of this program were designed for a wide range of language difficulties that were identified in the literature as effecting children with ASD. The interventions that were designed here were informed by: *developmental speech and language training through music* (DSLM) (Lim, 2012a, 2012b); Bruscia's (1982) research on echolalia; the work of Sussman (1999), a speech-language pathologist who developed support and training practices for parents, caregivers, and teachers of preschool children with communication difficulties; the researcher's own experiences working with the children with ASD. DSLM uses the elements of music to enhance and assist the speech and language development in children with speech and language impairments, including children with ASD (Thaut, 2005).

This program design is a goal-directed intervention designed for children with ASD who experience language difficulties. Once a child satisfactorily passes the initial speech/language development level, he or she will progress to the next level. Each individual achievement will be scaffolded to gradually lead to the greater achievement of improving the communication abilities and social interaction skills of the child with ASD (Lim, 2012a).

Intake process. The intake process for each child will begin with a referral from his or her school teachers, special education teachers, or a speech language pathologist who works for a center or school that the child attends. Upon receiving the referral, the music therapist

will arrange a meeting with the child's parent, guardian, or classroom teacher to complete the Individual Music Therapy Assessment Profile (IMTAP) intake form (Baxter et al., 2007).

Prior to starting the music therapy sessions, a speech-language pathologist will assess the participant's language level by using the speech language pathology evaluation form, such as Clinical Evaluation of Language Fundamentals – Preschool. Following the assessment, the music therapist will complete a separate assessment session using Baxter et al. (2007)'s assessment tool to assess the child's motor, sensory, communication, cognitive, emotional, social, and musical skills. After collecting all the information, target words for the child will collaboratively be selected by the speech language pathologist and the music therapist.

Session frequency and structure. The child will be seen by the music therapist once a week for a single school term, approximately 16 sessions. For one-on-one sessions, a quiet and open space with enough room for two chairs, a desk, and space to move and play musical instruments will be required.

All sessions will be structured as follows: greeting, warm-up, instrument or vocal intervention, movement, and closure. It should be noted that this is a general outline, and that sessions will be altered to best suit each child's needs as they arise. The target words and phrases will be evaluated through the use of pre and post-tests by the speech language pathologist. The music therapist also will evaluate the child's verbal production throughout the session (see Appendix A). The form contains a list of the target words and phrases, and the music therapist will write the date when the child produces each target word or phrase during the session.

Program goals and objectives. The primary goals and objectives of this music therapy program for children with language impairments with ASD are as follows:

Goal 1: To develop the child's receptive language skills defined as responding appropriately to choices that are presented to the child verbally by the therapist.

Objective 1.1: The child will look at the picture cards.

Objective 1.2: The child will develop imitation and turn-taking skills through the use of picture cards.

Objective 1.3: The child will develop his or her receptive language skills by independently following the verbal directions provided by the music therapist.

Goal 2: To develop the child's expressive language skills defined as speaking words without any verbal prompting.

Objective 2.1: The child will imitate the therapist's vocalizations five times in a session.

Objective 2.2: The child will imitate the therapist's verbalizations using the picture cards.

Objective 2.3: The child will develop his or her expressive language skills by speaking the target words and phrases independently.

Intervention 1. Greeting song, *It's music time!*

Intervention goals. The intervention goals for the greetings are:

1. For the child to develop a sense of making music with the therapist.
2. For the child to use the picture cards which facilitate understanding of what the therapist is saying.
3. For the child to develop both expressive and receptive language skills.

Essential content. The essential content for this intervention is:

1. For the child to be invited in the music therapy room.
2. For the therapist to provide and facilitate a safe space for the child.
3. For the therapist to provide songs and musical instruments for the child's tasks.

Intervention plan. At the start of each session, the music therapist will pick up the child at his or her classroom and bring him or her to the music therapy session. The therapist will do so by showing the child a music picture card and singing the phrase, "It's music time." In the initial sessions, if the child appears to be more willing to come with his educational assistant, the therapist, child, and assistant will walk to the music therapy room together.

The room will be set up so that there will be some musical instruments in the room and a small desk beside the therapist upon which the picture cards will be placed. Where the child is to sit will be indicated by the placement of coloured mats placed on the floor and/or chair. If the child is not sure what to do, the therapist will sing the phrase, "Which one do you want to have?" while showing the two differently coloured cards. The child will choose a coloured card and sit on the corresponding mat. If the child refuses to choose, the therapist will choose one colour card, show the card to the child while saying the colour, and invite the child to sit on the matching coloured mat.

Structured protocols are important for children with ASD (Buday, 1995; Wigram & Gold, 2006). Therefore, the *It's music time!* song (see Appendix B) will be sung first at every session to structurally cue to the child that it is time for music therapy. While showing a picture card representing music, the music therapist will sing *It's music time!* at least two times to focus the child's attention. Also, the music therapist will insert the names of the child and of the therapist into the song.

Ideally, over time, the song will become a familiar song for the child, and the child will be cued to say the word "music" when presented with the corresponding picture card during the song. As the child becomes familiar with the song, the music therapist will insert pauses such as "It's _____" to cue the child to say the word as part of the song. After

repeating this process many times, the child will hopefully be able to sing the entire song. This is an intraverbal skill that defines expressive language. A word or phrase produces another one, much like the concept of word association; however, the two processes are not identical. For instance, "It's music time! It's fun to sing! It's fun to play! (child's name & therapist's name) play music together. We are happy!" This language achievement technique applies a Gestalt law of perception as a whole (Lim, 2012a, 2012b).

While singing the song, the child will also be asked to select his or her favorite musical instrument to play. This intervention should help foster therapeutic rapport between the child and the music therapist so that the child associates the music therapist and music making with fun, sharing, and collaboration.

Intervention 2. Musical instruments

Intervention goals. The intervention goals for musical instrument interventions are:

1. For the child to make choices using picture cards or musical instruments.
2. For the child to develop turn-taking skills.
3. For the child to develop his or her ability to verbalize.

Essential content. The essential content for this intervention is:

1. For the therapist to provide visual cues to encourage the child to make choices.
2. For the therapist to give a gentle physical cue to guide the child in taking turns.

Intervention plan. The ability to express requests and choices is important for children with ASD. The music therapist will let the child make choices by singing the choice song, *Which One Do You Want to Play*? (see Appendix C). In this scenario, the therapist would hold up two choices for the child, one which is his or her favourite musical instrument and one which is not. The therapist will repeat the song phrase a couple of times if the child requires

repetition to aid comprehension. According to Sussman, (1999), it should be noted that if the child does not have much experience with making choices, the child will be asked to choose the last item shown; if the child has echolalia, he or she will be asked to repeat the last item he or she hears. Thus the music therapist must pay attention to the needs of the child while also being mindful of the child's goals as stated by Sussman (1999). Through weekly repetition of the exercises, the child should develop his or her choice-making skills and will eventually choose one instrument from two possible choices.

Each time the child chooses an instrument, the therapist will encourage him or her to say or repeat the name of the item. After the child says the name successfully, the therapist will set a new goal for a different target phrase to encourage the child to verbally request the instrument. The child will be further encouraged to verbalize his or her request by saying "I want _____" to the tune of a pre-determined familiar melody. This will be reinforced by the therapist giving the child's favourite musical instruments after the child has verbalized a choice. As the child learns how to say the phrase, the music itself will be phased out until it is a spoken request.

Using the child's favourite instrument is also a good method for working for turn-taking by combining the favourite instrument with a song such as *Shake!* (see Appendix D). If a shaker is the child's favourite instrument, the therapist will sing the phrase "Shake, shake, shake, shake a shaker, shake it like a milkshake, and pass it to your friend." The therapist will pass the shaker to the child's hand, and then will sing the line again. If the child does not comprehend the process of turn-taking, the therapist will use the method of *hand-over-hand* assistance (Bruscia, 1982; Sussman, 1999). Hand-over-hand support shows the child what to do by placing the therapist's hand on or under the child's hand to guide the child physically

through the action. The music therapist will pass the shaker, and, at the same time, she will hold the child's other hand and touch the child's shoulder while saying, "(The child's name)'s turn." Then, the therapist will sing the passing song again. When the child passes the shaker to the therapist, the therapist will take the child's other hand, put it on her shoulder and say "(The therapist's name)'s turn." After repeating this exercise many times with the child, the child will be encouraged to sing the song and say whose turn it is to play with support from the therapist. From this process the child will begin to understand the meaning of taking turns. Children with ASD may not always comprehend possessive terms such as *you, your, I, my, me* (Sussman, 1999). Thus the combination of touch and stating the person's name provides clearer instructions as to whose turn it is. This begins to foster understanding of the concept of turn-taking as the therapist will use "your turn" and "my turn" as phrases within the song. Gentle hand-over-hand cuing supports the child through the turn-taking process. However, a therapist should be mindful not to overuse touch so the child does not become dependent on physical cues for guidance.

Intervention 3. Movement

Intervention goals. The intervention goals for movement interventions are:

1. For the child to understand the words or phrases by responding to or imitating directions.
2. For the child to develop and/or improve receptive language.

Essential content. The essential content for this intervention is:

1. For the child to attend and listen to music.
2. For the child to imitate the therapist's movements.
3. For the therapist to provide musical prompts for the target words.
4. For the therapist to provide material for the movement exercise.

Intervention plan. The therapist will provide some movement songs that include target words such as "slow" and "fast", or "stop" and "go". For movement exercises both live and recorded music will be used. The song *Slowly and Fast* from Hap Palmer's CD entitled *Rhythms on Parade* (Palmer, 1995, track 18) will be played to get the child's attention. The objective will be to have the child spontaneously say "slowly" and "fast" as he or she follows the instructions of the song while waving a big scarf. The song incorporates the word "stop" and cues to "stop" in the middle of the song which establishes a defined structure for the movement exercises.

For this exercise, the music therapist will provide a large scarf that will also be utilized during a parachute game to the music. During the parachute game, this scarf will be used for additional movement exercises such as the song "Peek-a-boo" which embeds the phrase "where are you?" The use of this scarf will work well for both movement and conversation interventions.

Within the context of movement interventions, the child will also learn words and phrases through movement exercises accompanied by live music, for example the song *Teddy Bear Playtime* (Palmer, 1994, track 13). The music therapist will embed the target words into the song and demonstrate to the child how to move to the words using a small object such as a scarf, soft toy, or ball. The child will be encouraged to imitate the various movements, and will also be cued to stop upon hearing various rhythms. By building an association between the movement and the target word, the child will gradually develop an understanding of the target word's meaning. If the child moves in his or her own way, the therapist will improvise music in correlation to the child's movements while describing his or her movements in a few words or a short phrase. Repetition and creative movements will motivate the child to utilize

the target words and phrases. Interacting with and responding to the therapist will encourage the child to initiate interactions on his or her own.

Intervention 4. Songs

Intervention goals. The intervention goals for song interventions are:

1. For the child to respond to the words and phrases on picture cards.
2. For the child to respond verbally.

Essential content. The essential content for this intervention is:

1. For the child to be encouraged to sing the songs as cued.
2. For the therapist to compose the songs utilizing the target words and/or phrases.
3. For the therapist to cue the child to speak the target words.

Intervention plan. The therapist will compose songs with the purpose of embedding the target words and/or phrases. As each child will be at his or her own individual language developmental level, all songs created will be short, simple, and repetitive with three to four words in each line. Each song will incorporate a distinct rhythmic pattern. The target word will be embedded at the end of each line to encourage its memorization, and to allow for easy transition from having the child repeat the word to having the child fill-in-the-blank. This is a way of using the *recency effect* which is defined as, "A tendency in memorizing a list of items for the last items to be most easily recalled" (Corsini, 1999, p.811). This can work especially well when children start displaying tendencies toward echolalia (Sussman, 1999). First, the music therapist will sing the song several times naturally, and begin to pause just before the target words or phrases showing each corresponding picture. Then, fill-in-the-blank words or phrases will be gradually increased in accordance with the child's language development. After the exercise has been repeated many times, the therapist will begin to encourage the

child to sing full lines. The music therapist will gradually remove the music to transition the child from singing to speaking target words and phrases.

To develop the child's language skills, music will be used as mediator and reinforcement. The target words and/or phrases in the songs will be a cue for the child to follow. In this way, music and lyrics will serve as a mediator to communicate the message. The child's interest in playing his or her preferred instruments will reinforce his or her use of language skills as the child's preferred musical instruments will be used within activities to encourage the child to follow the directions. Music serves as a mediator because the song used will incorporate lyrics that will encourage the child to verbalize his or her choices.

Sessions. To achieve the goal-oriented music therapy intervention for developing language skills of children with ASD, a single school term of approximately 16 sessions in length will be divided into eight blocks based on the step-by-step structural and functional protocol.

Every weekly music therapy session will follow the same structure within which the order of interventions will be as follows: (1) greeting song, (2) musical instrument exercise, (3) movement exercise, and (4) goodbye song. However, the music therapist may alter the structure based on the child's needs. The target words will be determined based on the child's individual abilities. Fourteen words and two phrases have been pre-determined for the context of this thesis. The words are: "sit down," "music," "more," "finish," "happy," "fun," "up," "down," "right," "left," "thank you," "slow," "fast," "instrument's name (e.g., shaker and/or guitar)"; the two phrases are: "I want [name of object or thing] and "[name of the child and the therapist and my]'s turn."

The number of sessions will be based on the child's individual progress, therefore intervention goals and strategies will be described in eight blocks rather than within a predetermined number of sessions. Sessions will be held once a week for 30 minutes at a set time in the same room comprised of two chairs, one desk, and musical instruments. Throughout the sessions, the therapist will speak slowly and clearly using simple words and directions. A visual session schedule with Velcro picture cards will be used as an outline to represent the order of activities. In each exercise the therapist will tell the child which exercise will be done by pointing to its corresponding picture on the schedule. After an exercise is finished, the corresponding card will be placed in the "finished" box.

For the sake of clarity and in order to avoid awkward repetitions of the expression "he or she" etc., in the section which follows, I will use the following convention: the therapist will be referred to as of the female gender i.e. "she," "her"; the child will be referred to as a male i.e. "he," "him," and "his."

Block 1. The goals of Block 1 are for the child to feel comfortable in the new environment with the therapist and to participate in the session.

Session plan. The music therapist will pick up the child at the classroom. The therapist will show the corresponding picture card related to "music" to the child, and sing part of the song, *It's Music Time!* (see Appendix B). Then, both the child and therapist will walk to the session room together.

Upon arrival at the session room, the child may express an interest in some of musical instruments in the session room. When the child demonstrates interest in an instrument, the therapist will give it to him while showing the corresponding instrument's picture card and saying the instrument's name. Each picture card will be placed on or beside

the corresponding instrument prior to the session. The therapist will let the child play the instrument for approximately five minutes. While the child plays the musical instrument, the therapist will sing his favorite song which will be determined by the Individualized Music Therapy Assessment Profile (Baxter et al., 2007). Singing the song will help the child to have a chance to develop a sense of familiarity in the new environment. After finishing the child's preferred song, the therapist will sing the song, *It's Music Time!*

Colored mats will be placed both on the chair and the floor to show the child where he can sit. If the child does not understand the phrase "sit down," the therapist will show the child the picture card "sit" while touching the mat on the chair and floor. The child will then select either of the mats to sit on.

During the musical instrument exercise, the therapist will put a tambourine with its corresponding picture card in front of the child and invite him to tap it. If the child does not understand the word "tap," the therapist will take his hand and tap the tambourine together using the hand-over-hand technique. Then the therapist will sing the song *This Is the Way We Play* (see Appendix E), and the child will tap the tambourine according to the song. The tambourine will be held in front of the child in different directions, and the child will be encouraged to follow the directions in order to tap the tambourine. According to the author's clinical experience, people diagnosed with developmental challenges including children with ASD respond well to this exercise.

During the movement exercise, the therapist will sing the familiar song *If You're Happy and You Know It* while encouraging the child to move according to the lyrics: clap hands, stomp feet, jump, touch body parts, and vocalization. If the child does not understand the words, the therapist will show the actions, and the child will imitate the therapist.

The therapist will tell the child when it is time to say "goodbye" at the end of the session. The therapist will show the corresponding picture card while singing the song *Goodbye Song* (see Appendix F). After singing the song, the therapist will say that music is finished while pointing to the picture card "finish" on the visual session schedule. After putting the "finish" card in the finished box, the therapist will show the child the corresponding picture card related to the "classroom". The therapist will walk the child back to the classroom.

Block 2. After completing 2 weeks of Block 1 or when the child looks comfortable being in the session room with the therapist, the program will move on to Block 2. The goals of Block 2 are for the child to become comfortable following the therapist's instructions and learning the target words and phrases on the picture cards.

Session plan. When the therapist picks up the child from the classroom, the child will be encouraged to identify the picture card "music" and the therapist. The therapist will give the child the "music" card while singing part of *It's Music Time!* The word "music" will be sung at the same interval as it is in the song, and then the therapist will say, "Give me the 'music' card please." If he displays a lack of understanding, the child will be encouraged to extend the right hand in front of the card and help give the card back to the therapist through the use of hand-over-hand assistance. Once the card is returned, the therapist will encourage him to give the therapist a high-five as a reinforcement. The therapist will kneel down when showing and passing picture cards so that the therapist's eyes are level with the child to encourage eye contact when he passes the card back to the therapist.

In the session room, the therapist will start to sing the song *It's Music Time!* while pointing at the picture "music" on the visual session schedule. The therapist will pass the child

the “music” card and sing the song *It’s Music Time!* while playing the guitar. After singing the song, the therapist will say: “Give me the ‘music’ card, please.” When the therapist says this, the child will sing the word “music” at the same major third interval as in the song *It’s Music Time!* Then the therapist will take the “music” card off of the visual session schedule and place it in the finished box.

During the musical instrument exercise, each time the child chooses an instrument, the therapist will give him the chosen instrument with its corresponding picture card. Then the therapist will say, “Give me the [the name of the instrument] card, please” while extending her right hand in front of the card. If he does not understand what the therapist is requesting, the therapist will help using hand-over-hand assistance. After the child returns the card to the therapist, the therapist will accompany the child while he plays an instrument of choice. Then the therapist will sing “[The child’s name], do you want to play ‘more’ or ‘finish’?” to the melody of the choice song *Which One Do You Want to Play?* showing the child the corresponding picture cards related to “more” and “finish.” The order of the words will depend on the child’s interest. During this exercise the therapist will be using the “recency effect” that the child will be asked to repeat the most recently presented item. For instance, if he looks happy and wants to play more, the therapist will say the word “finish” first and then “more” last. If he looks less interested in playing the instrument, the therapist will say “more” first and “finish” last. This will encourage the child to choose and verbalize the word which would be closer to his desire. Using the melody of the choice song, the child will have a sense of being asked about picking one of two choices. If he keeps choosing the “more” card for a while, the therapist will hand him the “finish” card while pointing at the instrument card on the visual session schedule. The therapist will tell him that the instrument exercise is finished,

and put the corresponding card in the finished box. Then the therapist will tell the child that the next exercise is the movement exercise while pointing to the movement card on the visual session schedule.

Next, the movement exercise will begin with the therapist opening a *pareo* which is a soft colored cotton cloth about the size of 180cm × 90 cm. The therapist will encourage the child to hold the pareo's edge using both of his hands. The therapist will hold it as well, and they will move the pareo up and down together like a parachute while listening to a recording of the song *Slow and Fast* (Palmer, 1995, track 18). The therapist will have extra cloths of different materials such as cotton and nylon to accommodate for possible hypersensory or hyposensory sensitivities.

The session will close with the *Goodbye Song*. The therapist will say that music time is almost over. In the *Goodbye Song*, the therapist will touch the child's shoulder using hand-over-hand techniques whenever the child's name is sung in the lyrics. Then, when the therapist's name is sung, the therapist will use hand-over-hand techniques to take the child's hand and point to the therapist's shoulder. The use of hand-over-hand techniques while singing both the child and the therapist's name will give the child a sense of a taking-turn element. After the song is sung, the therapist will give the child the "finish" card and say: "Music is finished." The child will be asked to give the "finish" card back to the therapist, and the therapist will show him the "classroom" picture card. Then, they will return to the child's classroom together.

Block 3. After a few weeks of doing Block 2 or when the child has acquired the skills set out in Block 2, the sessions will progress to Block 3. The goals of Block 3 are for the child to try to purposely use the picture cards and to utter at least three target words.

Session plan. As in the previous sessions, the therapist will pick up the child at his classroom. The therapist will show the child the "music" card and sing the song *It's Music Time!* with blanks. For example, the therapist will sing, "It's [ ]," and then wait for the child's response. If the child says "music time!" he will get a high-five as reinforcement. If the child does not respond verbally, the therapist will hand the child a picture card while saying "music time!" If he repeats after the therapist "music time!", he will get a high-five and will be told, "Good job!" If the child does not say any words, he will be asked to give the card back to the therapist. Then the therapist will say, "Thank you," and sing the lyric, "It's music time!" to the same melody as the song *It's Music Time.* Afterwards, both of the therapist and the child will walk to the session room together.

In the session room, the therapist will sing a fill-in-the-blank version of the song *It's Music Time!* while playing the guitar. The therapist will pause and wait for the child to say, "music time," in the provided blanks.

During the music instrument exercise, the child will choose one instrument from two instrument choices while listening to the choice song (see Appendix B). The child will be given the instrument and its corresponding picture card, and then will be told to give the picture card back to the therapist. When the child passes the card to the therapist, he will be encouraged to repeat the name of the instrument after the therapist says it. He will play the instrument along with the therapist as the therapist plays the child's favorite songs or an improvisation. Each time a song is completed, the child will be asked if he wants to play "more" music or to "finish" with the aid of the corresponding picture cards. In this block, the order of the words will be changed from time to time such as the desired word being asked first. For instance, the child will be asked "more" first and "finish" last when he is enthusiastic

to play. When the child's interest in the instrument diminishes, the therapist will ask, "finish" first and then "more" last. Children with language difficulties in ASD tend to choose the last word they hear (Sussman, 1999); therefore, this exercise will help to demonstrate the child's understanding level about the words "finish" and "more" while developing his expressive and receptive language skills.

During the movement exercise with the song *Slowly and Fast*, the contrasting tempo will give the child a sense of movements and help him to distinguish the tempo. The child will say "slowly" while waving the pareo and being shown the "slow" card. The child will say "fast" while waving the pareo energetically and being shown the "fast" tempo card.

The session will close with the *Goodbye Song.* When the therapist touches the child's shoulder, the child will say his own name with the therapist. When he points to the therapist's shoulder with the help of hand-over-hand assistance, the child will try to say the therapist's name with the therapist. When the child is shown the "finish" card, he will say, "finish". Then the therapist will tell the child to go back to the classroom without showing the corresponding picture card before returning to the classroom together. In this block, the child might understand the protocol of closure; therefore, the therapist will diminish the use of the classroom card by saying the word instead.

Block 4. After a few weeks of doing Block 3, or when the child has acquired the skills set in it, the sessions will progress to Block 4. The goals of Block 4 are for the child to choose and play various musical instruments, to use more picture cards purposely and accurately, and to utter at least six target words.

Session plan. When the therapist shows up at the child's classroom, the child will say, "music time!" without seeing the music card.

Before singing the song *It's Music Time!* in the session room, the therapist will invite the child to strum the strings of the guitar. While he strums the strings, the therapist will press down the chords and sing the song once through. The second time through, the therapist will sing the fill-in-the-blank version while cuing the child to say "music time" by showing him the "music" picture card. The therapist will also begin to integrate the picture card for "happy" after singing the lyric, "We are [ ]."

During the musical instrument exercise, the therapist will sing the choice song every time a choice is given. The child will pick the instrument and its corresponding picture card. As the child begins to understand the concept of making choices, the therapist will start showing pictures of the instrument only while singing the choice song. The child will pick one card, and the therapist will give him the instrument corresponding to the chosen picture card. The therapist and the child will play the instrument together to his favorite song, a new song, and/or through improvisation.

The therapist will ask the child whether he wants to play "more" or "finish" using those corresponding picture cards. In this block the word's order will be random.

The therapist will say, "peek-a-boo" in the movement exercise with the song *Slowly and Fast*. The therapist will say, "peek-a" lifting the pareo up as it will hide both the child's and therapist's faces. When the pareo is moved down, the therapist will then say, "boo." After repeating this exercise, the child will be encouraged to say, "boo" while uncovering his face. This interactive exercise will provide motivation for the child to vocalize and then verbalize words.

The session will close with the *Goodbye Song*. The child will say, "music" or "music time" when he sees the "music" picture card. The child will say his name and the

therapist's name depending on where the music therapist points. After the song, the therapist will pause for the child to verbalization. After the therapist says, "Music is," the child will say: "Finish!" At this stage, it is important to utter the word, thus the therapist will not correct the grammar (finished instead of finish) yet. Following the song and verbalization cue, the therapist and child will return to the classroom.

Block 5. After a few weeks of doing Block 4 or after the child has acquired the skills set out in it, the sessions will progress to Block 5. The goals of Block 5 are for the child to respond to the verbal instructions, to use picture cards accurately, to become comfortable with the introduction of new exercises, and to utter at least eight target words.

Session plan. The therapist will sing the song *It's Music Time! a*nd the child will sing along while walking from the classroom to the session room.

In the session room, the therapist will sing the song *It's Music Time!* pressing down the guitar chords and the child will strum its strings. He will say, "music time" after the therapist sings the word "It's" as a fill-in-the-blank song. In the same manner, the child will say "happy" after hearing the phrase, "We are."

During the music instrument exercise, the therapist will show picture cards of two musical instruments and verbally ask the child "Which one do you want to play?" Once the child has selected an instrument, the therapist will give the instrument that is on the picture card while singing the lyrics "pass it to your friend" of the song *Shake!* For instance, if the child choses a shaker, the therapist will sing, "Shake, shake, shake. Shake a shaker. Shake like a milkshake, and pass it to your friend." The child will be passed the shaker, and then the therapist will sing the song again. If the child does not play the instrument, the therapist will help him to shake it using hand-over-hand techniques, and then the child will be encouraged

to pass it back to the therapist. This exchange exercise will be repeated several more times. The therapist will ask the child whether he wants to play "more" or "finish" by showing the corresponding picture cards. The exercise of passing the instrument to someone will be new for the child, and, as a result, the therapist will pay attention to his feelings regarding whether the child wants to play continually or finish the exercise. The order of asking those words will be chosen according to the child's facial expressions and body language. As was done in Block 2, the therapist will put the child's desired word last. If the child looks like he wants to play more, the therapist will show "finish" first and "more" last. In this way, the child might be better able to communicate "more." Achieving a successful outcome with a familiar exercise within the new exercise will help the child to develop self-esteem and confidence.

In the movement exercise, the therapist will stretch out her arms while saying, "up", and kneel down saying, "down" holding the pareo. As in previous blocks, this will be done to the song *Slowly and Fast*. The child will be encouraged to imitate the therapist's movements, and will say "up" and "down" while completing the actions.

The session will close with the *Goodbye Song.* The child will say, "music" or "music time" when he sees the "music" card. The child will be encouraged to sing all the lyrics with the therapist, and sing both the child's own and the therapist's names without pointing cues. After singing the song, the therapist will say, "Music is," and then pause. The child will say "finish" before returning to the classroom with the therapist. If the child says "finish", the therapist will correct: "Music is finished."

Block 6. After a few of weeks of doing Block 5 or after the child has acquired the skills set out in it, the session will move on to Block 6. The goals of Block 6 are for the child

to respond more to the verbal instructions, to get used to the new choice exercise, and to utter at least nine target words and one phrase.

Session plan. On the way to the session room from the child's classroom, the therapist will sing the song *It's Music Time!* and will pause for the last word of each verse. The child will be encouraged to sing along including the missing words.

In this block the child will start to learn the phrase "I want." In the session room, the therapist will show two pictures and sing "Which one do you want to play?" to the melody of the choice song. If the child wants to play the guitar, the therapist will encourage him to say, "[child's name] wants to play the guitar". The therapist will touch the child's shoulder to encourage the child to repeat what the therapist says. Then the therapist will sing the song *It's Music Time!* showing the child the picture cards of the words, "music," "fun," "sing," "play," and "happy," while the child strums the strings of the guitar.

During the musical instrument exercise, the therapist will show the child two music instrument picture cards and ask the child while singing, "Which one do you want to play?" Following the music cue, the child will be encouraged to pick one. If, for example, the child chooses the shaker card, the therapist will pass him the shaker while singing the song *Pass It to Your Friend* as in Block 5. Then, the therapist will say, "[the child's name's] turn!" while taking the child's hand and touching his shoulder using hand-over-hand assistance. The therapist will sing the song again, and the child will pass the instrument whenever he hears the lyrics "Pass it to your friend." Then, the therapist will use hand-over-hand techniques to take the child's hand and point to the therapist's shoulder saying, "[the therapist's name's] turn!" This exercise will be repeated several times until the child develops the sense of a turn taking. During this exercise, the therapist will ask the child whether he wants to play "more" or

"finish" using the corresponding picture cards. As in Block 5, the therapist will pay attention to order the cards according to the child's facial expression, body language, and tone of his or her voice as a portion of the exercise is new.

In the movement exercise, the therapist will move the pareo saying the actions "up," "down," "right," and "left" to the song *Slowly and Fast*. The child will move the pareo according to the therapist's movements.

The session will close with the *Goodbye Song.* The song will be familiar to the child who will sing along with the therapist. The child will be encouraged to say the words, "thank you," "music," and "again," and the names of himself and the therapist. After finishing the session, the child will be encouraged to say, "Music is finished!" Then, the therapist and child will return to the classroom together.

Block 7. After a couple of weeks of doing Block 6 or after the child has acquired the skills set out in it, the session will move on to Block 7. The goals of Block 7 are for the child to start to diminish the use of picture cards, to respond to the verbal instructions, to get used to the exchange exercise, to understand possessive form, and to utter at least ten target words and two phrases purposely.

Session plan. On the way to the session room from the child's classroom, the therapist will wait until the child initiates singing of the song *It's Music Time!* While singing the song, the therapist will sing quietly to allow the child's voice to be more prominent.

In the session room, the therapist will show the child two picture cards of the words while singing the song *It's Music Time!*, and the child will pick the correct cards from the two choices indicating the words "music," "fun," "sing," "play," and "happy." During the music instrument exercise, the therapist will fade out the singing cue and say to the child slowly and

clearly, “What instrument do you want to play?” while pointing at the instruments. The child will touch the instrument or say the instrument’s name. The therapist will encourage him to say, “I want to play [instrument’s name].” The therapist will touch the child’s shoulder and say, “I want to play [instrument’s name].”Then the child will repeat after the therapist, and get the instrument. The therapist will begin to sing the song *Pass It to Your Friend*. The child will pass the instrument to the therapist after singing the lyrics, “Pass it to your friend.” When the therapist receives the instrument, the therapist will point to her own shoulder with the other hand while saying, “My turn.” On the child’s turn, the therapist will take his hand and touch his shoulder using hand-over-hand techniques to encourage the child to say “my turn.” The child and therapist will repeat this instrument exchange exercise several more times until the child says: “my turn.”

During the music instrument exercise, the therapist will ask the child whether he wants to play “more” or “finish” the exercise using the corresponding picture cards. As in Block 3, the order of the words will be changed to confirm that the child understands.

During the movement exercise, the child will move the pareo by following the therapist’s movements, and will be encouraged to say the words “up,” “down,” “right,” and “left,” while imitating the therapist to the song *Slowly and Fast*.

The session will close with the *Goodbye Song*, and the child will be encouraged to sing along with the therapist. He will say almost all of the words. After finishing the session, the child will say, “Music is finished!” Following the song, the therapist and child will return to the classroom.

Block 8. When the child has acquired the skills set out in Block 7, the sessions will move on to Block 8. In this last block, the child will display his acquisition of most of the target words and phrases purposely.

Session plan. The child will sing the song *It's Music Time!* alone, and the therapist will listen to his singing while walking to the session room from the classroom.

In the session room, the child will pick up the picture cards corresponding to the words: "music," "fun," "sing," "play," and "happy." These cards will be placed on the desk while the therapist sings the song *It's Music Time!*

During the musical instrument exercise, the therapist will ask the child, "What instrument do you want to play?" The child will say the instrument's name and pick it up. If the child does not say, "I want to play [instrument's name]," the therapist will encourage him to say the phrase. Then, the child will be asked to say the phrase independently. The therapist will sing *Pass It to Your Friend*, and the child will pass the instrument to the therapist upon hearing the lyrics, "Pass it to your friend". The therapist will receive the instrument and point to her own shoulder saying, "My turn!" The child will sing along with the therapist, "Shake, shake, shake… pass it to your friend," and receive the instrument from the therapist. The child will say, "My turn," while touching his own shoulder without hand-over-hand prompting. While repeating this instrument exchange exercise, the therapist will fade the use of physical prompts. This will be modeled during the therapist's turn as he will say, "My turn" without touching his own shoulder.

The therapist will ask the child whether he wants to play more or finish without using those picture cards. The order of the words will be random. When the child says, "Finish," the therapist will ask, "What do you want to play?" The child will respond by saying,

"I want to play [another instrument's name]." The child will retrieve the instrument and will play it with the therapist. The therapist will play the child's favorite songs or create a music improvisation according to the child's music, movements, or facial expressions.

During the movement exercise, the therapist will show the child two colored scarves and will ask him, "What color do you want to have?" to the tune of the choice song *Which One Do You Want to Play?* After the child reached for a scarf, the therapist will touch his shoulder and encourage him to say, "I want [color]." The child and therapist will open the pareo, hold the edge, put the colored scarf on the pareo, and wave and shake as they follow the directions in the song *Slowly and Fast*. First, the therapist will say, "up and down" and "right and left" while doing the movements. Then, the child will initiate the exercise by saying the words and imitating the therapist's movements.

The session will close with the singing of the *Goodbye Song*, and the child will sing along with the therapist. The child will sing all the lyrics clearly and say: "Music is finished!", and the child and therapist will return to the classroom while singing the song on the way back.

Summary

This carefully designed program consisting of eight blocks is a one-on-one song-based intervention to address language development with a child with autism spectrum disorder. The comfort of the session environment will be taken into consideration. The therapist's voice and facial expressions and the various exercises will be used to encourage positive engagement with the child. The child will participate in the exercises using picture cards corresponding to the target words and phrases which will be embedded into the songs. The session will be implemented depending on the child's progress. By the end of Block 8, the program should develop and improve the child's language skills. As each block is

developed to provide the child with positive experiences, each step will help develop the child's self-esteem and confidence. Consequently, this will motivate the child to improve his communication skills for daily living.

During the intervention sessions, the speech-language pathologist and music therapist will maintain contact and discuss the child's progression while sharing each other's knowledge. When the child acquires the target words and phrases, the two therapists will evaluate the child's language level, and will develop new target words and phrases.

Chapter 5. Discussion

Communication and language development impairment is a primary characteristic of children with ASD. Various therapeutic interventions including techniques from SLP and music therapy have been applied to address communication and language development with children with ASD.

My research question "What is an appropriate design for a music therapy program that utilizes songs for children with ASD?" resulted in an intervention design that incorporated music therapy, SLP, and knowledge from my experience working as a music therapist. Literature from music therapy, SLP, and psychology were analyzed, and the data were utilized in the creation of a singing intervention to address communication and language development with children with ASD. The clinical music therapy intervention that has been devised here is a goal-oriented procedure for speech and language development for children with language impairments. It includes strategies and detailed descriptions of the techniques to make the interventions easy to put into practice. Since there are similarities between the treatment strategies that music therapists and speech language pathologists use to help children with ASD to develop and enhance their language skills, it would be beneficial to actively share knowledge between the professions. Lim (2012a) stated:

> Both music and speech are aural forms of communication. In addition, music and speech share the same acoustical and auditory parameters such as frequency, rhythm, contour, intensity, waveform, timbre, and cadential factor. Therefore, carefully designed speech and language training through music might utilize a child's unimpaired ability to perceive music stimuli in order to facilitate speech production (p. 86).

Quite a few music therapists have collaborated with speech-language pathologists; however, there have only been a few studies exploring the usefulness of the collaboration itself (Geist, McCarthy, Rodgers-Smith, & Porter, 2008). Also, there are not many sources pertaining to the incorporation of SLP knowledge, experience, and consultation into music therapy interventions, as well as few sources regarding training in speech and language techniques for specific use within music therapy interventions for children with ASD (Gadberry, 2011; McCarthy, Geist, Zojwala, & Schock, 2008). Therefore, the intervention that was designed in this thesis could bridge the gap in the music therapy literature pertaining to how we use music therapy to address language development and acquisition in children with ASD.

Furthermore, this intervention research could contribute to the field of music therapy in that it can be adapted by other music therapists for their own practices. It could also be adapted to other fields such as SLP or Special Education to help address each individual student's needs. Musical experiences such as the incorporation of music and musical instruments for language acquisition could potentially enhance SLP or Special Education sessions.

This music therapy intervention program has been designed using the first step and part of the second step of Fraser and Galinsky's (2010) five-step intervention research methodology. Therefore, further research on the effectiveness of this intervention could be conducted by completing the remaining steps which would include a pilot program in step two, refinement and confirmation of the program in step three, test effectiveness in practice settings in step four, and the dissemination of the program in step five.

Regarding the potential for developing and improving both expressive and receptive language skills for children with ASD, five malleable mediators were identified within this research. The mediators consisted of: (1) developing interaction; (2) developing imitation skills; (3) developing turn-taking skills; (4) understanding of words using the augmentative communication tools; and (5) developing or increasing vocalization and/or verbalization.

Some children with ASD can improve their speech production in a short-term intervention program, while some children with ASD have an intact ability to produce speech sounds and are able to speak to a certain level but are unable to use their speech skills effectively (Lim, 2012a). According to some of the daycare, preschool, and elementary school teachers whom the author met in Canada and Japan, many children with ASD are not able to obtain specialized treatment such as music therapy or SLP. They may only see a speech language pathologist once a month or once a year. Thus, it is the author's hope that this research will help facilitate the integration of both music therapy and SLP programs into schools. The integration of music therapy and SLP programming into special education programming could allow for interdisciplinary collaboration to comprehensively support language development for children with ASD.

Limitations

This intervention research was limited by the author's limited knowledge of children with ASD. This knowledge base has been expanded as a result of the author's clinical music therapy experience and the supervision process involved in the completion of this Master's thesis. Even though this intervention research was designed based on existing psychology, speech-language pathology, and music therapy literature, the theoretical intervention described can be limited by the diversity in characteristics and severity of children with ASD.

Many children with ASD show similar symptoms, but display those symptoms in many different ways. Thus this design could be limited in its ability to be generalized to the broader population of children with ASD. Also, as this program was designed based upon an English-speaking environment, it may not be possible to transfer it across cultures and language differences. Lastly, as Smith (2011) described the cons of music therapy and SLP collaboration, some speech-language pathologists may be uncomfortable working with music therapy and vice versa. The professional competition between them may negatively impact the collaboration and general therapeutic efficiency for the children.

Conclusion

This research presented here outlines a song-based intervention to address language development for children with autism spectrum disorder (ASD) on a weekly basis for approximately 16 30--minute sessions during a preschool semester. The intervention was designed from the analysis of current psychology, speech-language pathology and music therapy literature. In addition, the researcher's own knowledge which was gained through music therapy training and clinical experience contributed to the creation of this intervention program. Five malleable mediators were identified as having the potential to improve the children's language skills, and the malleable mediators were paired with action strategies. These strategies and malleable mediators were utilized in the formation of a one-on-one music therapy singing protocol. The findings of this research could be used in music therapy clinical practice as well as a basis for further research.

In summary, more evidence-based music therapy intervention research is needed for children with language impairment in ASD. One of the primary deficits for children with ASD is related to speech and language skills (Fitzer & Sturmey, 2009; Heiderscheit, 2009; Lim,

2012a, 2012b; Wigram & Gold 2006). As a result of language impairments, some children with developmental challenges participate passively in their classroom (Braithwaite & Sigafoos, 1998), and some children with ASD may behave aggressively (Kern, Wakeford & Aldridge, 2007; Sousa, 2001). The American Music Therapy Association has stated that:

> Recognized as a related service, music therapy serves as an integral component in helping the child with special needs attain educational goals either through direct or consultant services. The strength of evidence is growing and music therapy interventions were reviewed for quality of evidence by the Cochrane Collaborative with favorable results (2010, p.1).

The incorporation of target words or phrases into songs using visual materials helps to facilitate the development of both receptive and expressive language skills of children with ASD and can lead to improved communication skills (Kern, 2012). Collaboration between music therapy and speech-language pathology is crucial for providing high quality services for the clients. Through the sharing of knowledge, experience, and techniques in addressing target words and phrases for each individual's needs, music therapists and speech-language pathologists can work together to effectively support the development of language and communication skills. This would impact the quality of life of the children as well as their families and caregivers.

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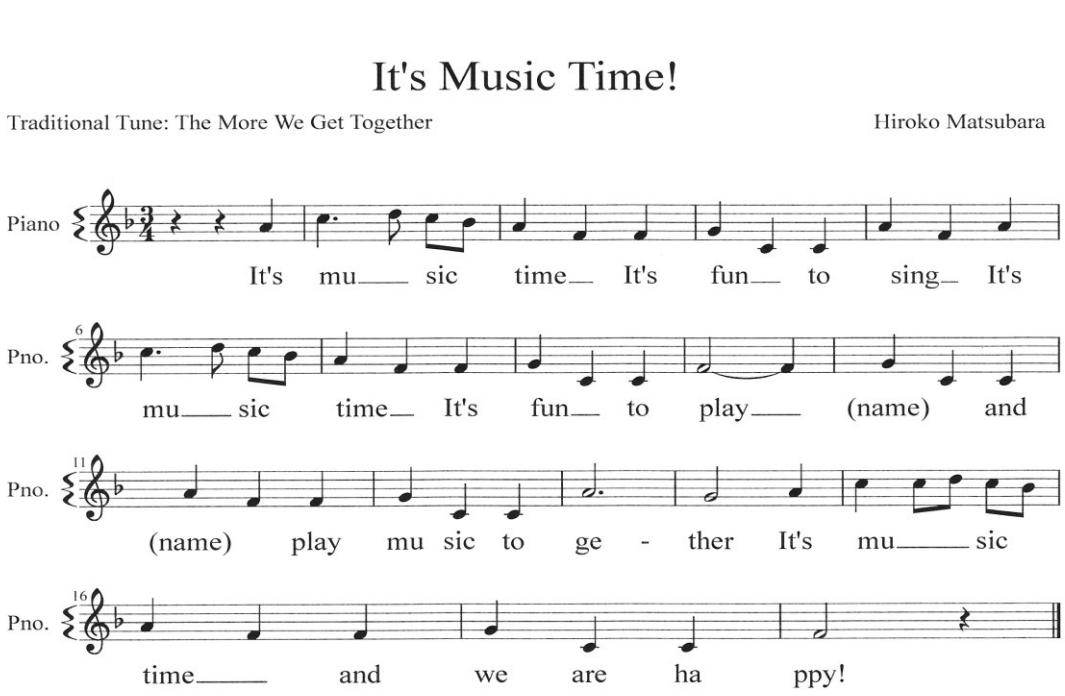
Appendix A: Verbal Production Evaluation

Verbal Production Evaluation

Target words/ phrases	Date when the words/ phrase are produced (using AAC)			Date when the words/ phrase are produced (without using AAC)		

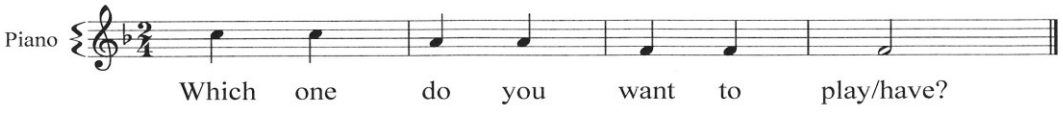
Appendix B: It's Music Time!



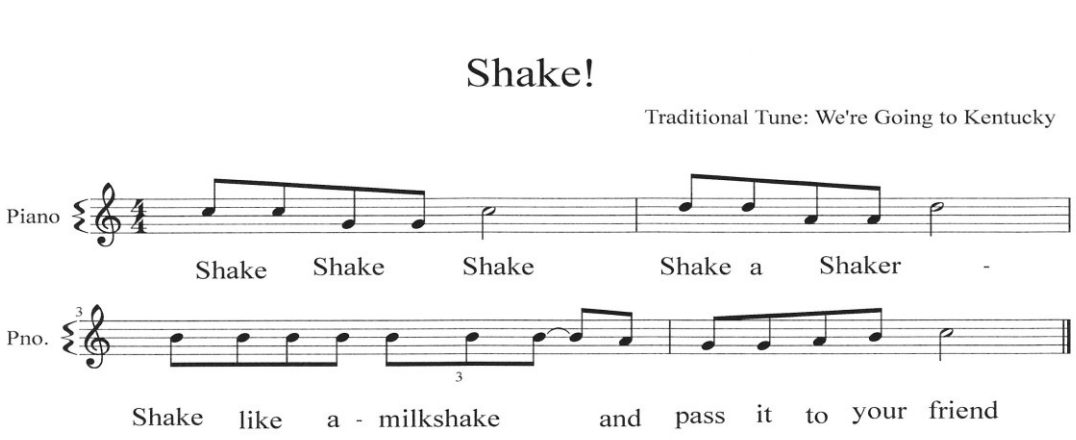
Appendix C: Which One Do You Want to Play?

Which One Do You Want to Play?

Hiroko Matsubara



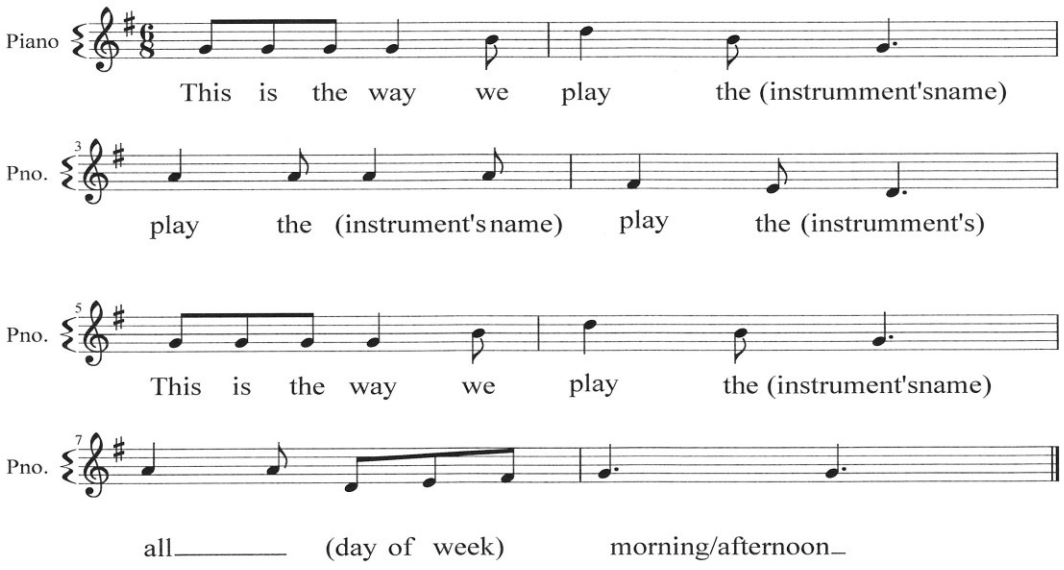
Appendix D: Shake!



Appendix E: This is The Way We Play

This is The Way We Play

Traditional Tune: Here We Go Round The Mulberry Bush — Adapted by Hiroko Matsubara



Appendix F: Goodbye Song