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# The Use of Music Therapy to Develop Speech and Language Skills in Children with a Tracheostomy as a Result of Premature Birth

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The Use of Music Therapy to Develop Speech and Language Skills in Children with a  
Tracheostomy as a Result of Premature Birth: Development of a Method

Capstone Thesis

Lesley University

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Music Therapy Specilization

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### **Abstract**

This capstone thesis project was created to answer two questions which have remained present throughout my work in early intervention. There is research that supports the positive impact that music therapy has on furthering the development of those dealing with chronic illness and medical attachments. This capstone thesis was created to examine exactly how does music therapy help those born prematurely and how effective are the interventions being conducted. Additionally, this thesis project examines how the work of music therapists in early intervention is processed by the clinicians themselves and how these intense sessions can affect them emotionally. It is focused specifically on premature infants and toddlers currently undergoing early intervention treatments for chronic lung disease and tracheostomy, as well as the development of speech and language skills within them. Using specific intervention methods throughout the project period and focusing primarily on one individual client, all sessions were tracked to follow the progress of her speech and language development through how many words or sounds were produced each week. Additionally, the clients, as well as my own, emotional responses to each session through artistic reflections. Though the goals described in this project were not met, as additional time would be necessary for completion, the progress made during the time of research for this project did signify a positive impact on the client and initiated a heavy emotional response from the intern.

Keywords: premature; tracheostomy; music therapy; speech; language

### **Introduction**

Each year, it is estimated that one in 10 babies are born prematurely in the United States. The Centers for Disease Control and Prevention defines premature birth as, “when a baby is born too early, before 37 weeks of pregnancy have been completed”. Although most premature newborns grow up to lead happy, full lives, a number of side effects and health concerns may follow them through their childhood and even into adulthood.

One of the most common long term medical side effects of premature birth is bronchopulmonary dysplasia (BPD), a disease that is specific to premature babies who are born with immature lungs. BPD can be treated and in most cases, the lungs develop fully to where they should be after two years of age, however, in some cases, children may develop chronic lung disease that resembles asthma and can affect the child for longer periods of time, even lifetimes. Depending on the severity of the disease, the child may need to receive ventilators or tubes in order to achieve successful breathing and therapy through nurses and early intervention specialists or clinicians to help the process of lung development so that the child may eventually breath, speak, and eat on their own.

One of the top uses for music therapy (MT) in early intervention services is speech and language development. Music is beneficial when it comes to this work because it “...provides a structured medium to accentuate the prosody or meaning of language in the context of an enjoyable, motivating stimulus” (Geist, McCarthy, Rogers, & Porter, 2008, p. 311). It is easy for one to remember and imitate a simple melody or words from a song because of the coordinated rhythms and pleasant tones. Thus, music therapy is one of the most rapid growing therapeutic services used in the treatment of children with speech and language delays.

Examining the current interventions being used in music therapy can provide insight to further develop and improve speech and language skills in children using early intervention services for medical issues due to premature birth. Working with one client in particular, and tracking the development, artistic reflections will be created after each session to document words or phrases that stand out.

### **Literature Review**

#### **Bronchopulmonary Dysplasia**

No two children are the same, and each child may experience different symptoms and side effects along with BPD. Each year, an estimated 10,000-15,000 cases of BPD are reported (Davidson & Berkelhamer, 2017). BPD was first reported in 1967 when a group of premature infants who developed the disease after receiving ventilators for immature and undergrown lungs, or what is now known as, respiratory distress syndrome. Historically, criteria needed to define BPD lacked significantly, thus resulted in limited scientific research on the topic. The earliest medical definition was as simple as the necessity for oxygen requirement at 28 days after birth. However, this definition failed to account for the high variable of clinical practices as well as the wide range of symptoms that come along with the disease. Thus a new definition was created to account additional symptoms and treatments. The current definition takes into account “total duration of oxygen supplementation, positive pressure requirements and gestational age, in addition to oxygen dependency at 36 weeks post menstrual age” (Davidson & Berkelhamer, p. 2, 2017).

There is very little information currently on the long term effects of BPD as adults who are available to study are representations of outdated care. With what data from studies is available, there is an identified growing concern for persistent pulmonary issues that may appear later in life (Davidson & Berkelhamer, p. 2, 2017). An estimated 71%-81% of children with

severe BPD requiring home ventilation survive, however, there is additional studies showing greater incidences of sudden infant death syndrome (SIDS) due to the disease. In adolescence, survivors of BPD may experience asthma-like symptoms, exercise intolerance, compromised pulmonary defenses, and pulmonary arterial hypertension.

BPD not only effects breathing, but can also effect the child's oral language skills and eating skills. Due to the underdevelopment of lungs, and the child's inability to breath on their own, the child may also struggle with the ability to formulate words. In most cases, the child will receive what is called a tracheostomy tube. This tube may interfere or block the child from fully expressing with their voice. The child may eventually receive a speaking tube which will allow for the child to begin developing oral language skills (Davidson & Berkelhamer, 2017).

### **Tracheostomy**

As a result of immature lungs and the necessity for home ventilation, the child may require a tracheostomy. This is a medical procedure that is performed due to lack of air getting to the lungs. According to John Hopkins Medicine (2017) most children who receive a tracheostomy have a need for prolonged respiratory support. A tracheostomy is a surgical process that consists of creating an incision through the neck into the trachea, or windpipe. This incision allows for direct access to the breathing tube. The tube is then placed through this opening to provide an airway and remove any secretions from the lungs. The child then does all breathing through the tracheostomy tube rather than through the nose or mouth. While most surgical tracheostomy procedures are successful, as with any medical procedure, there are risks. Early complications that can arise during the procedure and shortly after include: bleeding, air trapped in lungs or deeper layers of chest, damage to the esophagus, injury to the recurrent laryngeal nerve, or blood clots and mucus that may block the tube. Later complications that may

occur when the tube has been in place for a while include: accidental removal of the tube, infection in the trachea and around the tube, and damage to the windpipe (John Hopkins, 2017). In a study conducted by the national audit of pediatric intensive care, or PICANet, a survey was sent to all families of children who received a tracheostomy in the years 2002-2009 at all United Kingdom paediatric intensive care units (PICU). The results of this survey showed that of the 1,613 children to receive a tracheostomy in the PICU, the death rate in children who underwent a tracheostomy was a mere 5.58%, with a significant portion being infants rather than older children (Wood, McShane, & Davis, 2012).

Though the negative side effects and complications of a tracheostomy seem daunting, the advantages to receiving one vastly outweigh the disadvantages. With a tracheostomy, the child may experience greater levels of comfort, airway protection while unconscious, enhanced nursing care, enhanced communication, and eventual gradual weaning of ventilator supports (John Hopkins Medicine, 2017). With the tracheostomy and the placement of the tube, the child is offered a greater chance of eventually being able to breath, speak, and eat on their own.

### **Speech and Language Developmental Milestones**

Language and speech disorders in young children are typically developmental; the first three years of life are the most intense and influential years for acquiring speech and language skills. There are critical periods for speech and language development (known in early intervention services as developmental milestones) in children when the brain is best able to absorb language. (American Speech-Language-Hearing Association, 2018) The first signs of communication occur when the infant learns to cry and how the cry will provide knowledge of their wants and needs. The newborn can also identify familiar sounds in their environment, such as the voice of their mother or father. By six months of age, most babies will recognize the basic

sounds of their native language. They will also begin to babble and make both short and long groups of sounds. Between the first and the second year of the child's life, they will understand what others are saying and can follow simple commands. The child will also develop their first words. By two years of age, the child should have about ten words in their vocabulary and their phrases may consist of a mix of "jargon" and real words. They will also begin to explore the use of language to express emotions. At the age of three, the child should be able to form at least three to four word phrases and uses words to have a better understanding of the world around them (American Speech-Language-Hearing Association, 2018). While the level of these milestones may vary in each child, some children may have higher levels of ability than others, the developmental milestones are a brief overview of the minimum expectations for each age.

Speech and language development is heavily affected by the amount of language input that the infant is receiving whether at home or in social settings. Ramírez-Esparza, García-Sierra, & Kuhl conducted a study in 2014 to determine just how effective language input is for the developing infant. The authors of this study evaluated associations between infant speech in different social scenarios and hypothesized that 1:1 interactions between the parents and their children would significantly improve the speech utterances in the infants. The results of this study highlighted the importance of personal social interactions between the adult and the child and confirmed this hypothesis. The study also indicated that the use of natural speaking styles used in their culture may contribute to language learning (Ramírez-Esparza, García-Sierra, & Kuhl, 2014, p. 888). This supports that a child learns most of their language and furthers their speech and language development primarily by listening and observing those around them.

### **Early Intervention**

If the child does not appear to meet the minimum expectations of development for their age, the parents may choose to refer or be referred to early intervention services. In Massachusetts, early intervention is defined as “a program for infants and toddlers who currently have, or are at risk of having, a developmental delay (that is, children who develop differently or at a slower rate than most other children),” and “uses a family-centered approach [which]...helps families recognize and understand their child’s particular developmental needs, and learn different ways to help their child” (Massachusetts Health and Human Services, 2018). Services are provided for children ages birth to age three.

A child’s progress with consideration of the identified goals and services is reviewed typically on a six-month basis. If by the time the six-month review comes around and the child has not progressed in a beneficial way, then the child’s IFSP will be adjusted or updated to accommodate for better successes in EI. After one year, the child will be assessed once more using the Battelle. If the child no longer qualifies, or shows needs for services based on clinical judgement, then a transition plan is created in order to give the family information on services outside of early intervention and next steps such as schooling or counseling (Thom Child & Family Services, 2018).

The child and family may receive services such as speech, occupational therapy, music therapy, mental health counseling, and disability. In Massachusetts, the family does not pay anything for services. Early intervention is provided as part of the health insurance plan and the Department of Public Health (Thom Child & Family Services, 2018). The EI centers and programs themselves receive funding from the government and through grants and charitable donations (Massachusetts Health and Human Services, 2018).

Early intervention has proven to be one of the most effective services offered by the Department of Public Health for the benefit of children and families. According to performance data released by the early intervention division of Massachusetts, in this state alone from 2015-2016, 55.83% of children who received early intervention in a timely manner demonstrated increased developmental growth in social-emotional skills, with 94.06% of children in EI using appropriate behaviors to meet their needs (Massachusetts Department of Public Health, 2016). Similarly, music therapy services in early intervention has proven to be beneficial to the child. A 2008 study analyzed the effectiveness of a music therapy program within early intervention for both parents and children. The study, based on self-reports from parents regarding their child, showed significant improvement in child social play skills and communication skills. In addition, the study also showed improvement in parental mental health and self-sufficiency. (Nicholson, Berthelsen, Abad, Williams, & Bradley, 2008).

### **Music Therapy**

In early intervention, music therapy stimulates all senses and facilitates developmental skills using a multi-modal approach. Music therapy helps to “encourage socialization, self-expression, communication, and motor development” (AMTA, 2006). MT also helps to stimulate cognitive functioning and can be used for speech/language development.

When working with children, the music therapist seeks to encourage development in areas such as the child’s self-awareness, confidence, readiness skills, coping skills, and social behavior. Particularly in early intervention settings, the music therapist will coordinate with other professionals who are part of an interdisciplinary team working with the child. Each intervention is designed specifically for the benefit of the child based on a set of realistic goals and target

objectives. From there, the music therapist will document, evaluate, and make recommendations regarding the child's progress (Music Therapy and Young Children, 2006).

One of the main intervention types in music therapy with children is repetition of songs, activities, and movements. This helps to strengthen the brains neural processors for learning and teaches children to practice, master, and retain knowledge. In addition, repetition helps children learn to differentiate variations and differences in the world around them as well provides children with the opportunity to develop the confidence to progress in learning (Montessori Academy, 2017).

### **Integrating Music Therapy and Speech**

In recent years, speech-language pathologists and music therapists have been working together to develop and improve techniques that will address various and occasionally complex communication needs of children with disabilities (Geist & McCarthy, 2008). Music therapists are trained to adapt elements of music in order to promote effective communication and strategies in children.

There are many ways in which music can be incorporated into speech-language therapy. Research has found that techniques within music promote an increase in breath and muscle control (Peters, 2000; Cohen, 1994), stimulated vocalization (Staum, 1989), developed receptive and expressive language skills (Miller, 1982), and improved articulation skills (Zoller, 1991). Musical strategies that may be incorporated into the therapy include: relaxation exercises, breathing and vocalization exercises, song articulation, word and phrase rhythm chanting, and vocabulary and concept development singing (Zoller, 1991). Working in tandem with other forms of speech therapy, the music therapist uses interventions such as picture cards and improvisational techniques to solidify use of specific words or phrases.

Music therapists can incorporate both signing and singing together in order to create total communication practice. A study completed by Buday in 1995 involving ten children showed that children with disabilities “learned more signs when they were paired with music and speech than when they were taught or with music alone or speech alone” (Geist, McCarthy, Rodgers-Smith & Porter, 2008). Each of the ten children were taught fourteen signs under two separate conditions. The first condition was teaching signs through music and the second condition was teaching signs without music. In every child, the preferred method of learning as well as the more effective method of learning came under the condition of teaching signs through music. By teaching and repeating simple one word signs such as “more” or “all done”, the child will be able to express wants or needs if unable to communicate them verbally.

### **Method**

A method was developed based upon a seven-month internship at an early intervention site. Music therapy sessions at the site consisted primarily of a routine session plan of songs and musical interventions that consisted of a repetition within the lyrics and a melodic structure that was deemed beneficial to enhancing the oral language skills of children in their early childhood years. The method was based upon a developed intervention used by the MT supervisor at the site. Session plans involved circulated between a repertoire of ten familiar songs combined with several different instrument, movement, or finger puppet interventions. When using this type of method, the child’s sponge-like brain may be able to absorb similar phrases and words and begin to adapt them into their language skill set. The words or phrases chosen in each song were intentional and matched with the child’s current goal set; the goals were established by the speech language pathologist and the music therapist.

### **Client M**

Client M is a 19-month-old female of Haitian descent. She was born prematurely at 25 weeks, weighing only one pound and 15 ounces at the time of birth. M currently resides with her mother, father, and little sister at their home in the basement level apartment. With her medical conditions and necessary interventions, she spends most of her day at home in the care of her family. Due to premature birth, M's lungs were much smaller than the average sized lungs of an infant and after three weeks of life, she received a diagnosis of bronchopulmonary dysplasia, followed by a diagnosis of chronic lung disease. M has required constant attention and care for the first year and a half and the family has needed additional at home medical care assistance. A tracheostomy was performed when she was 12 months, in order to allow more air to flow freely; this necessitated a feeding tube. M's lungs have seen significant growth since the placement of the tracheostomy, and she has been weaned off of using the oxygen machines throughout the entire day. Since her overall health has improved doctors placed a speech tube within the tracheostomy at the age of 16 months in order to allow M to start exploring her voice and to gain further lung strength.

### **Session Plan**

At the start of the four sessions prepared for this capstone thesis, I had already been working with M for four months which included two months of clinical observation and two months of this author running the sessions in their entirety. Sessions with M happened over a four-week span and consisted of one music therapy session a week. Each session was one hour long and involved eight to ten songs and activities all chosen to work on enhancing M's oral language skill set. The layout of sessions remained the same throughout during all four weeks, however the order did change when necessary. The layout for each session was as follows (Table 1):

Table 1

## Layout of sessions

Type of intervention	Goal area addressed	Title of songs used
Hello song	Speech, cognitive	It's Time for Us To Say Hello!
Finger Puppets	Gross motor, speech, cognitive	All the little ducks Old Macdonald Had a Zoo Mm-Aah!
Movement	Gross motor, speech, social	I Like to Move It! Dance with Me
Instruments	Speech, social, gross motor	In The Jungle Lollipop
Improvisation	Speech, cognitive	Wheels On The Bus Early intervention site improve song
Goodbye	Speech, social	Who Is Wonderful?

Activities and interventions chosen for M consisted of movement songs, finger puppets, familiar children's songs, and improvisational exercises based off of M's current language skills. Prior to beginning these four sessions, M's oral vocabulary consisted of three words: woof, dog, and go. The goal of actively using ten words at the end of four sessions was set occurring over a one-month period of time.

### Hello and Goodbye Songs

The only two songs that remained in the same placement in the structure of the settings were the hello and the goodbye songs. This song was used for all music therapy sessions and were a familiar way to allow M to understand that the transition to music time has begun. The hello song consisted of several opportunities for the child to greet others by name as well as

identify those around them and say simple words like: hello, music, and play. I repeated the song several times through in order to greet everyone in the room including parents and clinicians. M was prompted throughout the song to say hello and identify those in the room with them by their name. This encouraged M to begin to develop the language skills for names and also for greetings.

The goodbye song consisted of opportunities to say words like: all done, music, and bye. M was offered opportunities throughout the song for M to sign “all done” as well as to vocalize it. When asking who is wonderful, M was prompted her to identify herself with words like “me” or by using her first name. This encouraged M to develop language skills for closing conversations.

### **Movement Songs**

A selection of movement songs which allowed the opportunity for M to be active to were incorporated into sessions and used to encourage further oral expression. Movement songs were used to encourage M to make her own choices and find ways to express what she wanted to do next within the song. M’s favorite movement song, as established in sessions before the start of this capstone project, was used in all four sessions. The song is titled “I Like To Move It” by popular artist will.i.am and was heard in the children’s movie franchise, Madagascar. It consists of up-tempo beats combined with fast lyrics and rapid movements like jumping, shaking, and moving forwards and backwards. Each instructed movement was repeated six times to give M enough time to really get involved in the movement. M was then offered the opportunity to pick what she would like to do next in the song. By offering two choices, like clapping or waving, M was encouraged to choose which one of the two options she is most interested in participating in.

Using prompting phrases such as “you choose”, “which one”, and “tell me”, M was stimulated and cheered on to further express vocally what she would like.

### **Finger Puppets**

Several sets of finger puppets were used in sessions to encourage M to vocalize different sounds and identify animals, emotions, and actions. M’s favorite set of finger puppets consisted of farm animals like a dog, cow, sheep, and chicken., so we sang “Old Macdonald Had a Farm” with this set of finger puppets. M was prompted throughout the song to verbally identify the names of the different animals. The finger puppets were used as a form of incentive for M to tell me which animal was being presented. If she correctly identified the animal in front of her, she received the finger puppet to hold onto and play with for the rest of the song. When the time came to make the noise for each of the animals, this author used phrases such as “Can you tell me what the cow says?” or by first presenting the sound and asking M to repeat it. Similar exercises were used with M using animals such as ducks or frogs and using puppets with faces on them to express emotions.

### **Improvisation**

Improvisational exercises are used in music therapy to promote production of different vocalizations. Sounds such as “ba”, “ma”, “me”, and “da” were among those which M regularly vocalized. A simple improvisational song that consisted of three chords (G, C, and D) was played repetitively while repeating back sounds that M created.

Observation notes were taken after each session in order to keep track of M’s progress. Particular attention was paid to significant words or phrases. whether it be something that M said or an emotion expressed that this author felt strongly drawn to. These words or phrases were then taken and incorporated in a weekly art reflection piece (shown in Figures 1-4; Appendix A).

Collages were created as a form of art reflection using magazine and newspaper cutouts because of the access to already printed words and phrases within them as well as the opportunity to take those words or phrases and incorporate and express some form of emotion behind them in a new way. This capstone thesis project followed the ethical guidelines and restrictions as stated by the American Music Therapy Association.

### **Results**

Sessions for this capstone thesis project happened over the course of one month's time and consisted of a weekly visit for one hour to client M's home. Present at each session were M, M's in-home nurse, this intern, and my supervisor. The general outlined structure of each session went: hello song, finger puppets, movement songs, instruments, improvisational songs, and goodbye song (as shown in Table 1).

#### **Session One**

M appeared tired for this session as it was close to her nap time and she had not had a full night of sleep the night before. M was quiet, wanted to stay seated for longer periods of time and was particularly attached to my supervisor and the in-home nurse. She wanted to be sitting in their laps at all times and hugging onto her in-home nurse as much as possible. The list of activities was not fully completed because of M's mood. The session began with the "I Like to Move It". M wanted to hold my hands and hang onto my arms as the movements progressed. Movements in this song included: clapping our hands, shaking, spinning around, and jumping. When offered a choice of two different movements: shake or spin around, M sat back down on the floor and made eye contact. M's reaction was to make a verbal choice was to become fussy and make whining noises. She then crossed her arms and made a pouting face until being reengaged with a story. At this time, M's in-home nurse stepped out of the room to answer a

phone call. M whined and followed after the nurse running with her arms out. There was no success at attempts redirect her by offering drums and shakers to play with. After ending the session M let out a very faint “bye” and waved. This was the first time we had ever heard her verbalize this word out loud and was accompanied with a sad facial expression and a faint whine.

While this session did not go as planned, it caused me to think on my feet and improvise by switching out songs and interventions. M did produce a new word that had never been heard before: “bye”. Initially, there was a feeling of frustration over the difficulties we faced just trying to get M to stay seated and present with us for longer than a few moments. For the artistic response (Figure 1), a heavy focus was placed on the positive aspects of the session rather than the negative. A picture of a car in a magazine was ripped it up into pieces to incorporate into the response as a way to represent the feelings that were rushing through me when driving away from the session in my car. All colors of magazine cutouts chosen were bright and positive. The word “bye” was handwritten in large letters because was the most significant part of the session, even though it was at the very end. In the center of the page, a face to represent the look of sadness which represented M’s face when leaving her home. A quote was also cut out that reads, “a space for me to learn to be open to other and to listen to...”. This reflects a positive outlook for the next session and that there was a wish to remain open and learn from M.

### **Session Two**

M was much less tired for this week’s session. Upon entering entered her home, M jumped up and down and verbalized “aah” noises while clapping and smiling. She sat patiently and waited for the music to begin. During the hello song, M was prompted to use the word “hello” to each person in the room. M created the sound for an “h” with her voice as she waved to her nurse. Using a duck song titled “All the Little Ducks” that was created within this early intervention

organization, M was prompted to create quacking noises for the ducks and invited to say the word “duck” within the verses. After three verses of the song, M said “duck” for the first time. Following this, farm animals were to encourage her to make animal noises. Although M previously knew the word for “dog”, she did not say it when prompted, but she did make a powerful and clear “woof”. When saying goodbye to M at the end of session, my supervisor and I waved and chose to wait to hear if she would say “bye” once again. Instead she chose to smile and wave.

During this session, two new words were said. M can be selective in saying the words that she already knows, so not saying the words “dog” or “bye” for a second week in a row was not a concern because since these words were present in her vocabulary. For the artistic response, (Figure 2) focus was put purely on M’s progress that she made with animal noises and names. Animal cutouts were incorporated that were sung about in the session, like the dog or ducks. The words chosen to focus on were duck and woof as these were the two new words that M vocalized within the session. Again these choices used a bright color scheme relating to the positive in the session.

### **Session Three**

Session three was unexpectedly moved to a different day during the week. M greeted my supervisor and I with a big smile and the same jumping and clapping as the week prior. The first half of the session focused on movement songs and allowing M to make choices. Using I Like to Move It, I offered M the choice of the movements jumping or shaking. Picture cards were used that illustrated the two choices. When M she pointed at the jump card she would then be encouraged to say the word “jump”. After a brief pause, M produced “jum-“. We viewed this as a success as M had vocalized most of the word, which showed us that she was making an attempt

to say it in full. The second half of the session focused primarily on improvisation. The early intervention improvisation song was used to encourage M to produce more sounds. The song began by singing the same sound of “da” over and over again and adding it to the familiar melody. M was prompted to sing along with me, but she did not respond and instead started at me. The song continued by switching to singing a “ma” sound. Once again I prompted M to sing along, but again she just continued to stare at me from across the room. We ended our session with our goodbye song and as my supervisor and I were leaving we said goodbye and were met with a very faint “bye” from M.

The improvisational section of this session could have gone better. The end goal of that song is to have M vocalize sounds along to the song and eventually control the different types of sounds by leading us instead of us prompting her with a different sound each verse. The session ended with a feeling of frustration over M not being able to vocalize the specific sounds. In Figure 3, I focused on this frustration in the collage. The color scheme is much darker and cut outs of clouds and poor weather at the top of the page were incorporated. The artistic reflection represents the lingering feeling that there was a dark cloud hovering overhead. At this point in time, I chose to relook at my successes and failures throughout the previous sessions and engage in some self-care before our fourth and final session.

#### **Session Four**

In the final session all of the songs that were successful in working with M these past few weeks. Present for this session were myself, my music therapy supervisor, and M’s in-home nurse. For this session A total of five songs were used: hello song, ducks, farm animals, movement songs, and goodbye song as well as in addition to the popular songs, this author also chose to include If You’re Happy and You Know It. M responded to this addition and used her

hands different parts of her body within the song. A verse was added: “if you’re happy and you know it, shout: hooray!” while waving arms in the air and excitedly shouting. This was the first time that this author had included this verse in work with M. Her response was positive and she waved her arms up as high as she possibly could and under airy breath let out a “hooray!” while shaking her head and body around. During the play with the farm animals, M spontaneously made the “woof” sounds for the dog and this time let out a light “moo” when it came time for the cow to appear. This author once again went to say goodbye to M as we were leaving, and M instead of saying “bye” this time, ran up to this author, gave a hug, and whispered “love”. This was the first time that my supervisor and I had heard her say this word. It came unprompted and when we looked back at M, she was smiling and waiting with arms wide open for a hug goodbye.

M was in a positive mood and enjoyed running through all the familiar songs and let out two new words: “hooray!” and “love”. Though we do often use the word love in songs during our session, prompting her to speak this word has not been a priority. Nevertheless, it was exciting to experience and to feel her genuine compassion towards this author. For the artistic response (Figure 4), I highlighted the word love and how it made me feel when I heard M say it for the first time. Cut outs of hearts and people embracing along with a bright color scheme were incorporated in order to represent feelings of pride and joy in the work that had occurred with M.

While M did not succeed in getting ten words in her vocabulary, she did achieve eight. More time was needed to expand M’s vocabulary to ten words. Although there were moments in the session where M chose not to participate or respond to prompts given for words although she was capable of saying these.

## **Discussion**

This capstone thesis project examined previous studies done by clinicians within the realm of infant and toddler care and the effects of music therapy on speech and language development. In addition, the project also revolved around a set of interventions and a method that I procured during a seven-month-long internship working at an early intervention center. By implementing this set of interventions on one client from the center whose speech and language were deterred by her need for tracheostomy, it allowed for the focus to shift from not only the emotional and physical reactions and responses of the child, but also those of clinicians as well. Set over the course one month, the interventions took place weekly for one hour sessions at the client's home. Interventions used included finger puppets, movement songs, and improvisational exercises. Words and vocalizations were tracked and processed through artistic responses done in the form of collage.

The outcome of this project was the client did not succeed in producing ten total words by the end of the four sessions. However, she did achieve eight different words and vocalized a range of different vowel and consonant sounds that had not been heard before. Ramírez-Esparza, García-Sierra, & Kuhl (2014) conducted their study to determine the effectiveness of language input in different interactions with those around them and how the different scenarios impacted the child's developmental language growth. The results of this study proved that the interactions between the adult and the child help improve the speech utterances in children. Previously highlighted in this capstone thesis, was the fact that the client did not have many opportunities for social interaction with adults outside of the home. This capstone was successful due in part to the positive interactions the client had with the clinicians involved. The client was happy and willing to play each week that the clinicians attended the sessions. She provided a positive level of energy that represented not only her excitement, but also her need for play with others. By

receiving encouragement and attention from adults outside of her own family and the in-home nurse, the client was exposed to different language styles. This exposure helped fuel her language learning and development throughout sessions.

A study completed by Buday (1995) involving ten children tracked their language production by teaching them words in two different settings, the first was with music and the second was without music. The results of this study showed that the children learned more language and signs when they were paired with music and speech together rather than having no music whatsoever involved in the learning process. The results of this study matched up well with the results of this capstone thesis project. Through the use of music therapy and music interventions, the client was able to enhance her language skills by adding eight new words to her vocabulary over the course of four weeks. The repetitive rhythms and lyrics allowed for the client to easily remember words being taught.

There were four art reflections created after each of the sessions in order to process what happened each week: the progress made in the client's language development, and the emotional responses of both the client and the intern. Each reflection featured a word or a set of words that were either new to the client's vocabulary or that the intern felt were relevant and important. The color scheme of each reflection was made intentionally to match the intern's emotional responses during and after each session. Brighter and happier colors represented moments that the intern felt were positive, and darker, grey colors represented moments that the intern felt frustrations and negative emotions. The artistic reflections allowed for a better understanding of not only what was happening in the client's language development, but also a better understanding to how the sessions were impacting the intern as well. By processing emotional responses through

artwork, it helped sort through internal conflicts and answered personal questions such as, why did you react in this way, and how did you feel after this significant moment?

Appendix A

Artistic Reflections

Figure 1



Figure 2



Figure 3

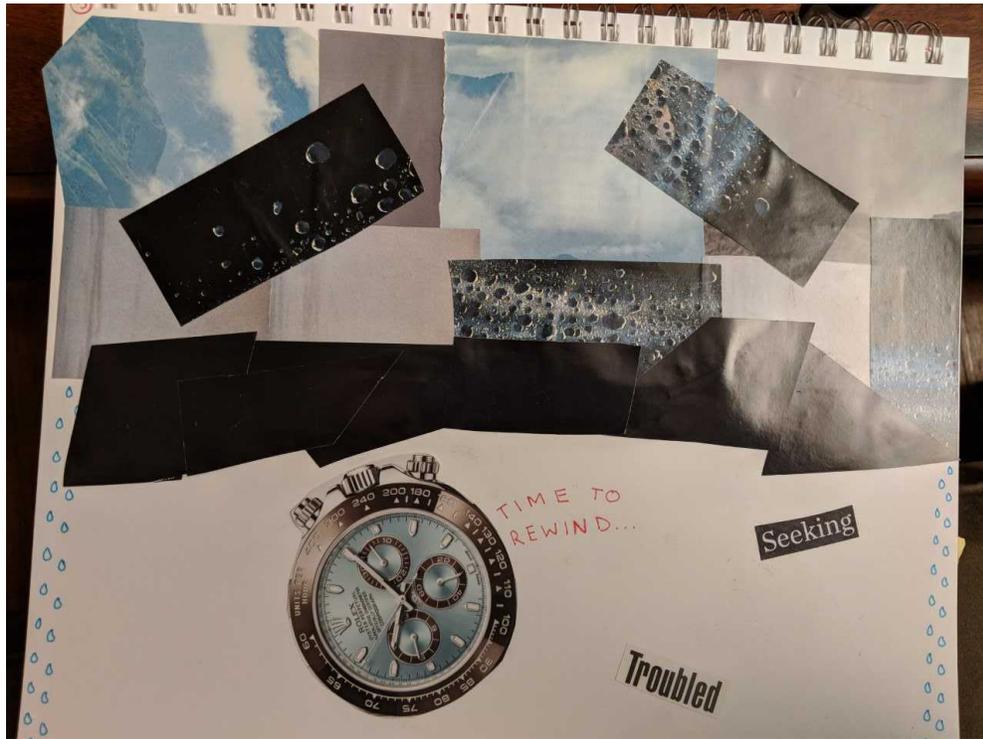


Figure 4



**Songs****Hello song**

It's time for us to say hello! In music today oh.

It's time for us to say hello, get ready to sing and play.

Hello to (child's name), hello to (child's name),

Hello to (child's name), get ready to sing and play!

In music time today.

**Goodbye song**

Oh who is wonderful? Who is wonderful?

Its (child's name), (child's name),

(child's name) is wonderful, wonderful today.

Oh goodbye everybody yes indeed, yes indeed, oh yes indeed,

Goodbye everybody yes indeed, yes indeed my darling.

'Cause music is all done, yes indeed, yes indeed, oh yes indeed.

'Cause music is all done, yes indeed, yes indeed my darling.

**All the Little Ducks**

Oh all the little ducks are swimming in the water (repeat x3)

All the little ducks are swimming in the water, bubbles, bubbles, and SPLASH!

Oh all the little ducks are diving in the water (repeat x3)

All the little ducks are diving in the water, bubbles, bubbles, and SPLASH!

Oh all the little ducks are kicking in the water (repeat x3)

All the little ducks are kicking in the water, bubbles, bubbles, and SPLASH!

Oh all the little ducks are jumping on my head, ACHOO! (repeat x3)

All the little ducks are jumping on my head, bubbles, bubbles, and SPLASH!

### **Old Macdonald Had a Zoo**

Old macdonald had a zoo, shoo bi do be doo

And in that zoo he had a (animal), shoo bi do be doo.

With a (animal noise x2) and a (animal noise x2) there,

Here a (animal noise), there a (animal noise), everywhere a (animal noise).

Old macdonald had a zoo, shoo bi do be doo.

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