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# The Inclusion of Music Therapy in Speech- Language Interventions

Torry Farnell  
*University of Arkansas, Fayetteville*

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The Inclusion of Music Therapy in Speech-Language Interventions

Torry L. Farnell

University of Arkansas

College of Education and Health Professions

Program in Communication Disorders

Honors Thesis

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Abstract

The purpose of this study was to investigate the inclusion of music in speech-language therapy. One hundred practicing speech-language pathologists (SLPs) participated in the study. There was no control for geographic location, length of time as an SLP, or work setting. A questionnaire devised from the research literature that gathered demographic information and the integration of music into speech-language therapy practices was used to gather data. It was electronically distributed via social media by means of a link that remained active for approximately six weeks. Data from the questionnaire was used descriptively to answer the questions of the study. The results indicated music is used in speech therapy across a wide range of settings with a variety of disorders; that it was used more with children than with adults; and that therapists believe that music use is beneficial in their interventions.

### The Inclusion of Music Therapy in Speech-Language Intervention

Speech-language pathology is a profession in which clinicians meet clients with communication problems, assess their potential to communicate, and create an individualized therapy program to help the client learn to communicate to the best of their ability (Conway, Crosson, Harnish, & Menizer, 2011). Communication involves two main features: the symbolic system, which is language, and the production system, which is speech. Some disorders, such as articulation disorders, are primarily about how speech is produced. Some disorders, such as aphasia, involve the symbolic system of language. Speech-language pathologists (SLPs) use a variety of approaches to treat both speech and language problems.

Music is a symbolic system and a universal language. As such, it is a communication system that has long been used for artistic purposes. While mentioned as a tool for healing since the time of Aristotle, it became a recognized therapy in the mid-20<sup>th</sup> century. Today, trained music therapists work alone or in conjunction with other health professionals to facilitate emotional, physical, and/or communication improvement in those who have developmental, chronic or acquired disorders/disease processes (<http://www.musictherapy.org/about/history/>). While not music therapists, SLPs recognize similarities between music and language. Levitin and Tirovolas (2009) write that "...music and language both represent complex, higher-order cognitive processes that invoke a large number of subsystems including attention, categorization, memory, and feature detection" (p. 221). Both musical structures and spoken language are organized in a specific order (Levitin & Tirovolas, 2009). A final point of comparison is that of instrumentation. In the case of music, one masters a type of instrument, e.g. violin

or piano, that is used to convey in an organized way the symbolic content. With respect to language, the physical body, and most particularly the larynx, tongue, lips, teeth, and nasopharynx are used to produce sounds that convey the organized symbolic units.

There are copious amounts of research on the role of music in health just as there are copious amounts of research on methods of intervention for speech and language communication problems. Therefore, using music as a partnering communication system for children and adults experiencing speech and language difficulties seems commonsense and perhaps commonplace within the profession. The purpose of this study is to investigate the inclusion of music therapy by SLPs in their interventions.

### **Review of Literature**

The literature on music, language and speech is examined in this review. Common speech and language problems experienced by adults and children are defined, and treatments that may include music components are described. The information is then briefly summarized as the basis for the specific questions of the study.

### **Music, Language, and Speech: Finding Connections**

Music and language are connected on a very basic level. Both use higher cognitive functions and subsystems like memory, attention, and categorization. Both musical and grammatical structures have a specific order that must be followed for the sequence to make sense (Levitin & Tirovolas, 2009). Speech and music also have pitch in common. While musical sequences have specific intervals, speech uses rough frequencies for intonation. For example, the difference between an exclamation, a statement, or a simple question is the variation in pitch used in the production of the spoken utterance. This direction of pitch statements in speech is also called contour. Infants can detect

contour in their interactions with mothers within weeks of birth (Bråten, 2008). This information suggests that knowledge of contour is either developed very early on or is even possibly innate. However, when brain injury is involved, that knowledge can be lost. If the right hemisphere is damaged, comprehension of intonation and its function in language can vanish. In contrast if the left hemisphere is damaged, while there will likely be problems understanding linguistic meanings, melody perception is typically unaffected (Baum & Zatorre, 2012).

Music can be used therapeutically for aspects of communication other than language. Auditory stimulation has been shown to improve listening skills, even in hard of hearing or deaf individuals. Auditory stimulation also expands the information processing capabilities of the brain, leading to improvements in many areas such as behavior, skill, self-regulation, coordination, and more (Vargas-Colon & Villasenor, 2012). A 2011 study investigated the impact of music on all aspects of social skills which is yet another part of communication. Over half of the participants in the study showed significant improvement in communication, problem-solving, ability to work in a group, interaction with peers, etc. after participating in either movement to music, musical performance, or some other form of musical therapy (Gooding, 2011).

Research also shows that the type of music selected for the therapy is very important. A study was done on brain function in musicians and non-musicians as the individuals were presented with different types of music. Almost all studies found that brain function was increased with classical music and decreased with rock music. However, the different categories of participants had different patterns of brain activity. Musicians showed left-hemisphere dominance while listening to music, while non-

musicians showed right-hemisphere dominance. Frontal lobe activity was increased in all individuals. Also, if a therapist is faced with a client under stress, this study proved music to be a wonderful stress-management and relaxation tool (Adalarsu, Geethanjali, Jagannath, & Naidu, 2011). A study by Bidelman, Hutka, and Moreno (2013) reviewed the shared brain structure between music and language processing. The study concluded that the relationship between language and music is “more than binary operations along common, shared brain pathways” (p. 9). The authors also view the “cross-domain influences as a continuum where the degree of ‘transfer’ depends on how commensurate the acoustic demands of the listening task in question are with the cues found in the listener’s domain of expertise (i.e., their native language or music practice)” (p. 9).

A number of researchers have investigated the close relationship between music and speech. Interesting insights were found in a study conducted by Farbood, Marcus, and Poeppel (2013) in which six experts with professional training in music theory had to determine the key a sample tune was played in, within restricted timescales that align closely with speech processing and beat induction. The temporal range in which key finding is optimal, and the time constraints for processing continuous speech are similar. The best range of modulation frequencies in speech intelligibility is slightly higher than the ideal range of a melodic sequence. The final observation made by the authors of this study was that “common physiological properties place broad constraints on the mechanisms by which human listeners can decode streams of auditory information, whether linguistic, musical, or otherwise” (p. 915).

## **Adult Disorders of Language and Speech**

When an individual suffers a stroke and the left hemisphere of the brain is damaged, it can cause the patient to have a language disorder known as aphasia (Bertolinelli, Gialanella, Lissi, & Prometti, 2011). In fact, of the 800,000 people each year that suffer strokes, between 25-35% of them will suffer aphasia (Bethoux, Boissy, Chemali, Conklyn, Novak, Smith, & Ziegler, 2012). Aphasia is a loss of language. This can range from simply not being able to find a word or words that one wants to say, e.g., anomia, to having difficulty structuring sentences that are grammatical, or having so much difficulty that only single words or phrases that don't make sense are uttered. Reading and writing as well as spoken language can be affected.

Aphasia can present with two types of speech production disorders: apraxia and dysarthria. With apraxia, the nerves and muscles of the mouth and tongue are intact, but the individual cannot produce sounds or words on command. Dysarthria, in contrast, results from a disconnection between the brain and the affected speech production muscles, such as those that make the lips, tongue, and palate move in a coordinated fashion (Haynes & Pindzola, 2007).

## **Child Disorders of Language and Speech**

The language and speech disorders experienced by children are usually developmental rather than acquired. For example, a child may simply not begin to talk when expected, may begin to talk then stop, or may never have a very full grasp of symbolic language. Children with these problems are diagnosed as having disorders that range from delayed language development to late talkers. In addition they may be labeled



as children with autism, general developmental delays, or specific language impairment (Paul, 2013).

Some children will have good language skills from the very beginning. They will understand what is said to them but will communicate only with the help of gestures and focused listening on the part of others. These speech production conditions range from developmental apraxia to fluency disorders to articulation disorders (Paul, 2013).

The paragraphs above describe language and speech separately; however, a large subset of children with developmental issues may experience both language and speech problems at the same time, which requires targeted interventions in each area. This said, both language and speech production are complex developmental processes that form the basis for social communication. Therefore, early and persistent intervention that pushes development forward is essential.

### **The Basis for Music-Related Speech-Language Interventions**

There are many ways music can be used in speech-language therapy. One option is simply auditory stimulation. This has been shown to expand the brain's information processing capabilities, possibly leading to improvements in areas like behavior and skill, self-regulation, sensory integration, coordination, and language skills. Therefore, auditory stimulation could be used to not only help clients improve their speech skills, but also help them focus their attention (Vargas-Colon & Villasenor, 2012). In general, the goal is to help patients whether they are adults or children, find a way to communicate other than speech, through the use of musical melodies (Baum & Zatorre, 2012).

## Therapy for Adults

Treatment during the stroke depends on the type of stroke. If it is ischemic, a blood clot dissolver is used to try to stop the blood clot. If it is hemorrhagic they merely try to stop the bleeding as quickly as possible. A speech language pathologist's job falls into the post-stroke rehabilitation category. This is where SLPs try to salvage whatever is left by the stroke and overcome the disabilities caused by the sudden damage of the stroke ([www.stroke.ninds.nih.gov/disorders/stroke/stroke.htm#What\\_is](http://www.stroke.ninds.nih.gov/disorders/stroke/stroke.htm#What_is)).

Melodic Intonation Therapy (MIT) is a type of therapy that is often used in cases where part of the brain is damaged. The theory behind this practice is that the use of the intact right hemisphere of the brain will gradually help recover whatever speech skills remain in the left hemisphere (Fox & Rau, 2009). For example, when an individual loses the ability to speak due to damage in the left hemisphere of the brain, melodic intonation therapy can be used to help them find a new way to communicate. This type of therapy combines words and phrases with melodies to make speaking more like singing. Melodic intonation therapy takes advantage of the patient's ability to sing, hopefully leading to an increasing ability to speak. The goal is that by getting the communication process started with melodic speaking, therapists can actually facilitate true speech output. Melodic intonation therapy can be used with right and/or left hemisphere damage, but it works differently depending on which hemisphere is damaged. This means that it can be used with any brain-damaged client, but it must be individualized to each client's specific case (Bethoux et al., 2012).

Response Elaboration Training (RET) is another form of therapy. This treatment allows for more flexibility in communication and creative language by using patient-

initiated responses rather than clinician elicited responses (Fox & Rau, 2009). For some aphasia patients, the personalized cueing method is used to help with naming deficits. In this treatment, the clients and therapists work together to come up with cues to help the client remember difficult names.

These are only a few of the many types of therapy often used to help individuals with aphasia. Some other therapies are functional communication treatment, gestural approaches: Amer-Ind code, and communicative drawing among others (Fox & Rau, 2009).

### **Treatments for Children**

There is an extensive literature that applies to specific developmental disorders, however, the goal of this review was to broadly make the case for using music across the domains of language and speech development in childhood. There are a variety of ways that therapists infuse music into their therapy with children. In each case, the goal is to promote language development, improve speech production, and general communication. Gooding's (2011) research that looked at music and SLP therapy provides a good summary of why this infusion works. In his conclusion he indicated that the children in his study showed significant improvement in all aspects of social skills, including communication, problem solving, interaction with peers, and the ability to work in a group.

One need look only as far as nursery rhymes to see that there is some connection between a child's ability to learn language and music. A study by Kouri and Winn (2006) reported on how singing (music) affects children's quick incidental learning (QUIL) of novel vocabulary terms. They researched this by reading a script to children, then singing

that same script to them and seeing which affected QUIL more. Their particular study did not yield conclusive results. However, another study done by Madsen (1991) found that 60 first graders who participated in an activity involving singing and hand gestures versus another activity involving speaking and hand gestures, were able to comprehend more nonsense words from the singing activity than the speaking. Yet another study performed by Hoskins (1988) found significant post-test improvements in children ages two to five on a melodic version of the Peabody Picture Vocabulary Test after the children trained with sung picture card descriptions.

Perhaps one of the earliest studies on the rate and order of acquisition of speech and musical development was conducted by Fitcher in 1931. The goal was to see if these were related. In the study, a child was observed from the age of 12 months to 19.5 months, and over that time, her vocabulary grew from zero words to 53 words. In the learning period, the child was subjected to long conversation or silence from her therapist, repeated naming of picture cards or objects, and records being played with a simple tune or melody and only one singer. The child could occasionally babble and hum tunes. The child showed an appreciation for the rhythm and tune of music. This study revealed that acquisition of speech and music may in fact be related.

Research on developmental differences for children with speech production problems as well as contributions from other allied health fields has contributed to the literature on using music for children who have difficulty producing speech. These are summarized as well as elaborated upon in Lim's (2011) text on developmental speech-language training through music that provides a guide for this type of therapy. These

studies on language and speech highlight the conclusion that music can play an important role in the learning of language and speech for young children.

### **Summary and Questions of the Study**

As can be seen from this review of the literature, research articles, books, and popular websites address the importance and the links between music and language. The literature also shows that there are some studies that have demonstrated that there is validity in using music in speech therapy. This ranges from stroke and Parkinson's disease with adults all the way to very young children who are just developing language and have to learn language in school. It seems that this is something that can be a vital part of speech-language pathology services across the lifespan in different kinds of disorders. However, there is limited information about how widespread the practice of SLPs using music is and the ways in which therapists are using it to reach treatment goals. This leads to the specific questions of the study.

1. How often is music integrated into speech-language intervention?
2. Is music integrated more in adults vs. children interventions?
3. Is music used to achieve specific goals in therapy?

### **Methodology**

#### **Participants**

Fifty practicing speech language pathologists (SLPs) were sought as participants in this study. There was no control for geographic location, length of time as an SLP, or work setting.

## **Materials**

A questionnaire devised from the research literature was used to gather data for the research project. This questionnaire asked information about employment status, type of work setting, years of experience, and uses of music in therapy across diagnostic categories (see Appendix A).

## **Procedure**

Practicing SLPs were contacted via list serves and other electronic media that provided a link to the survey. This was sent out twice, and then forwarded via a participant to a private list serve of Auditory Verbal Therapists where it became widely distributed. Due to the overwhelming responses, the survey was cut off at 100 participants in accordance with IRB approval. No responses beyond the first 100 were included in the dataset for analysis.

## **Analysis**

Answers to various items on the questionnaire were aligned with the questions of the study. Descriptions of the responses were used as the analyses. In addition, qualitative analysis was completed on item 10 of the questionnaire, which was open ended.

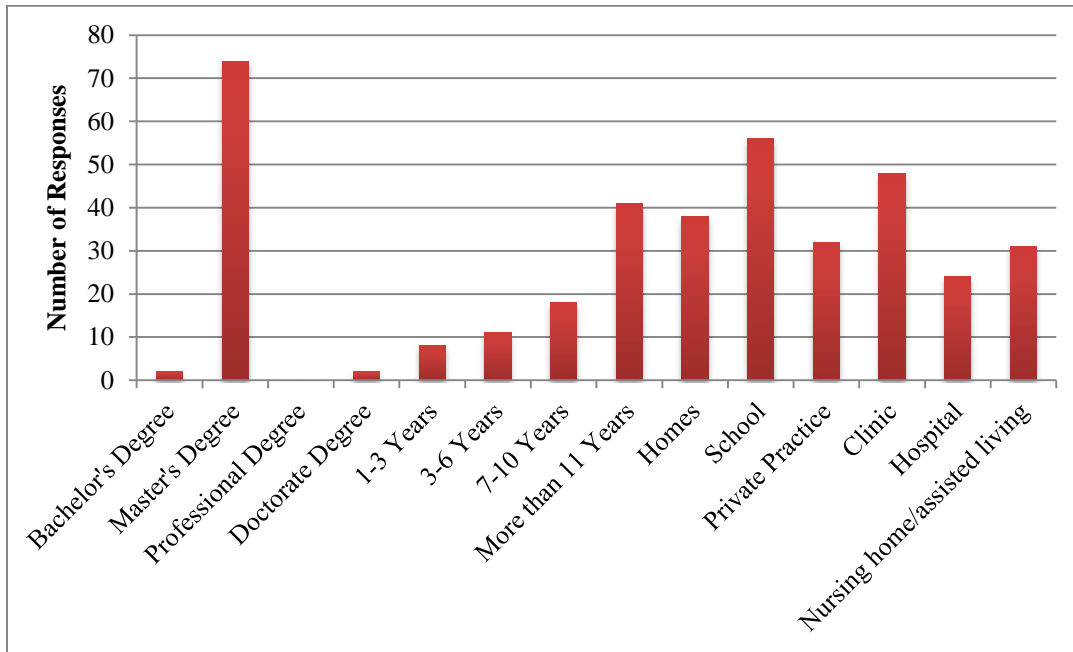
## **Results**

### **Demographics**

One hundred practicing SLPs participated in the study. Of the participants, 95% had master degree level education. The remaining 5% had bachelor or doctorate degrees. Fifty-three percent of the participants had worked more than 11 years as an SLP. The participants were fairly evenly distributed across their work environments. Thirty-one

percent worked in medical settings, while 73% worked in schools, homes and other non-medical settings (see Table 1).

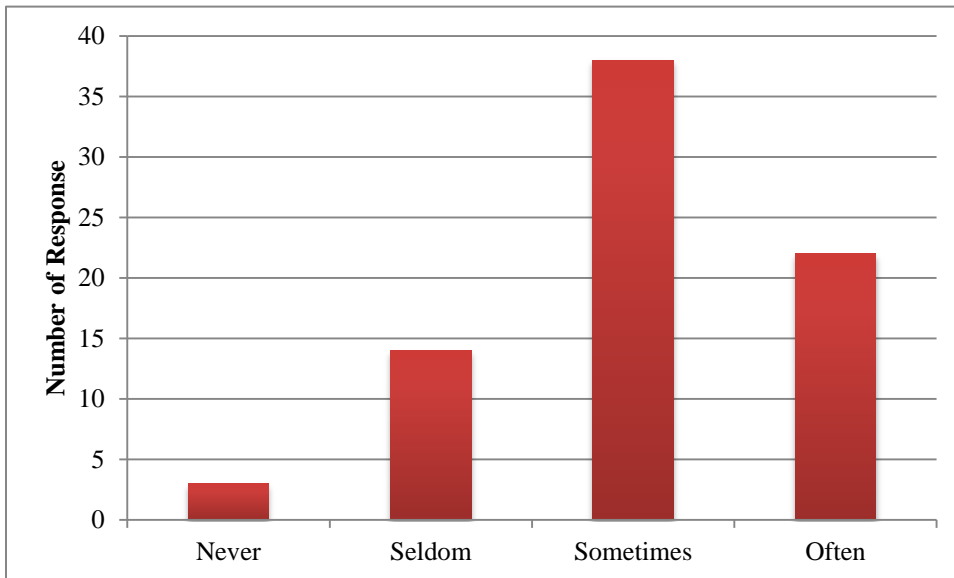
Table 1: *Participants by level of education, work experience, and work environment.*



As can be seen, the vast majority of the participants of the study had graduate level education, indicated by a master's degree, while the years of work experience and work environment were varied.

### Question One

The first question of this study asked how often music is integrated into speech-language intervention. The information from survey item five was used to answer this question (See appendix A). The responses ranged from a high of 49% to a low of 4%. Forty nine percent used music sometimes and 29% used music often, while the remaining 22% seldom or never used music (see Table 2).

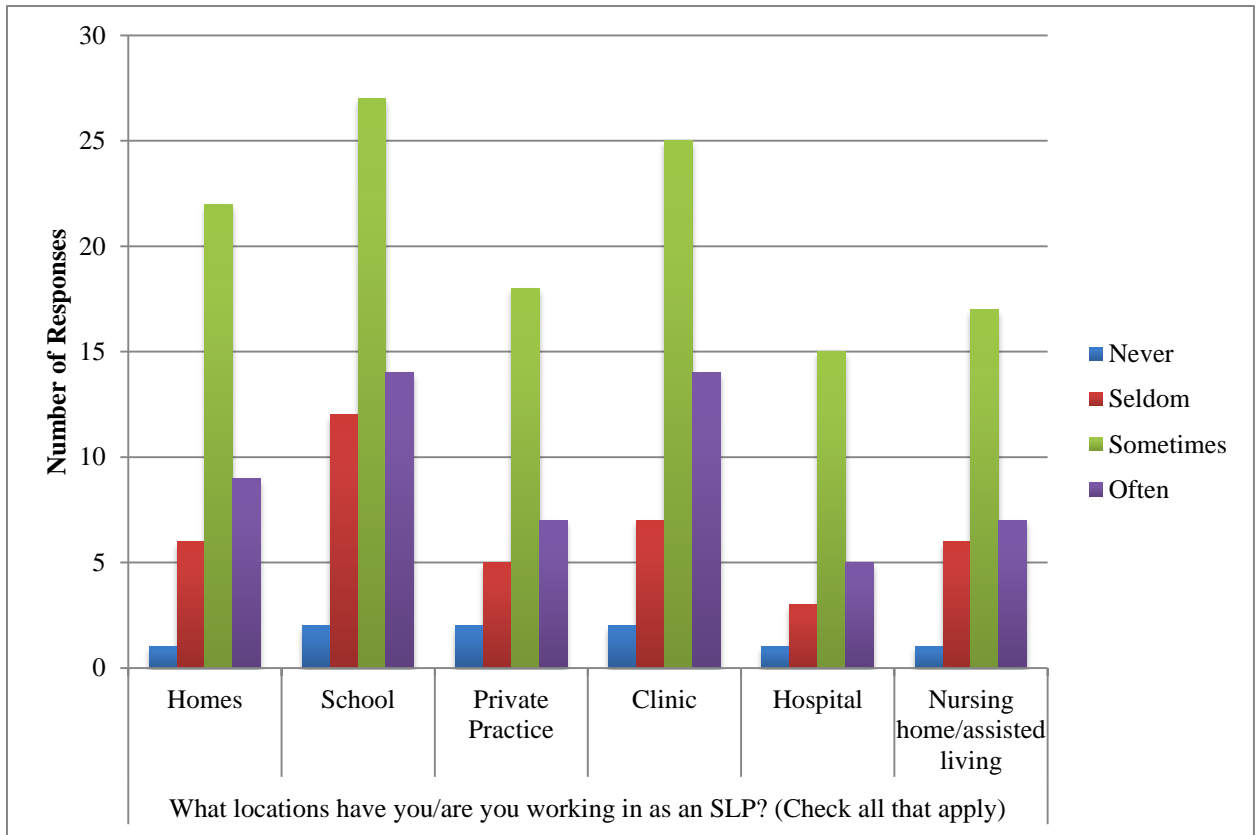
Table 2. *Frequency of music use in therapy.*

To expand on this question, items three and five of the questionnaire were combined to determine if music was used more often in one clinical setting versus others. The results suggest most of the participants use music sometimes in their sessions. School and clinic settings seem to have the highest occurrence of music in their therapy sessions.

(see Table 3).



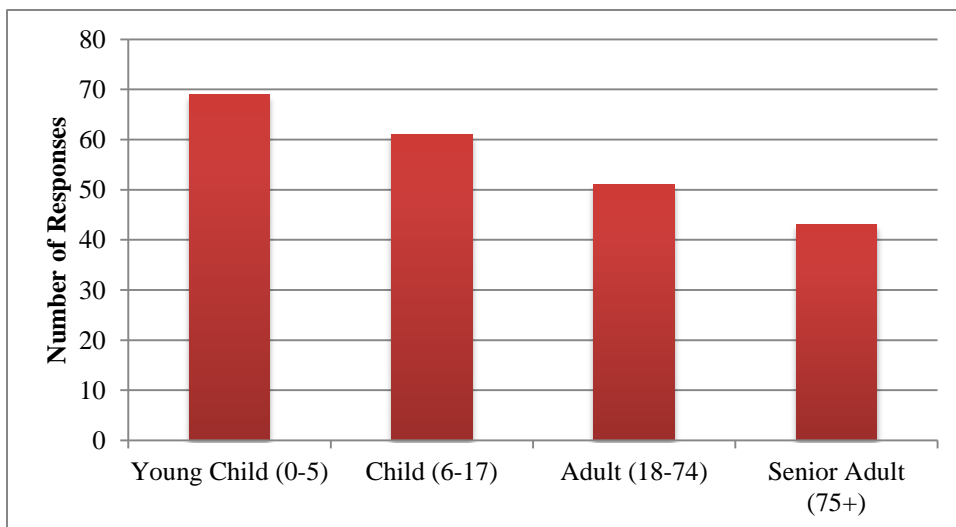
Table 3. *Use of music in speech therapy across therapy setting.*



**Question Two**

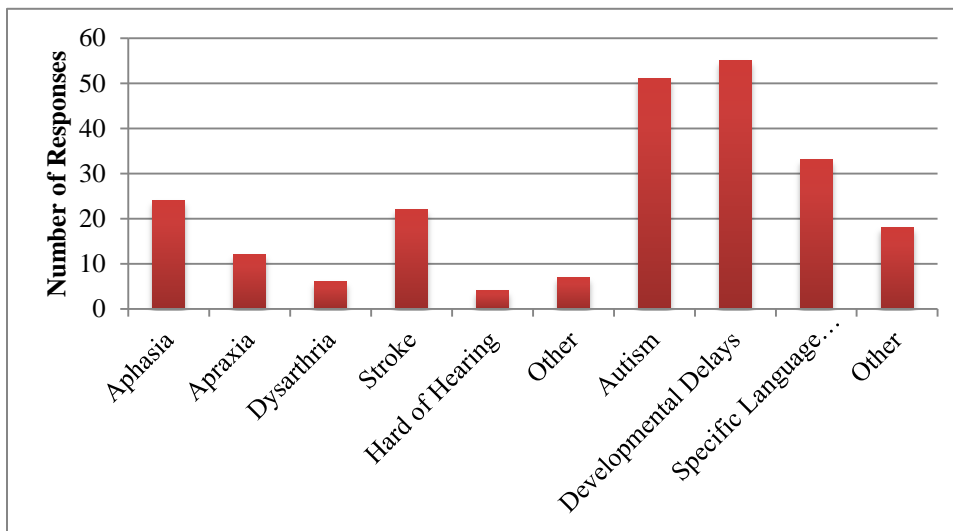
The second question of this study asked if music is integrated more in adults or children interventions. The information from item four was used to answer this question (see Appendix A). The responses revealed the music is utilized with both children and adults, with its use being slightly more common with children (see Table 4).

Table 4. *Age of client.*



To further elaborate this question, items seven and eight (see Appendix A) asked participants about the disorders for which music was used. In adults, aphasia was most common, while hearing impaired was least common. In children, music was most used with those identified as having developmental delays. Speech related disorders such as voice and fluency, were less common (see Table 5).

Table 5. *Type of disorders music is used with in adults and children.*



These results suggest that, among the participants of the study, music was used more often with children, and use in adults varied by the specifics of the disorder.

### Question Three

The third question of this study asked if music is used to achieve specific goals in therapy. Item ten from the questionnaire, which was open-ended, was used to answer this question. Fifty-nine participants responded to this item. All of the responses were printed and read through (see Appendix B) for analysis. The text was coded into categories in order to determine how and why clinicians were incorporating music into their speech-

language therapy sessions. Five categories emerged from the data: calming, focus, vocalization, language, and vocabulary. The following are examples of these.

*Calming.* One response stated that when used with a child with a sensory disorder, the music calms her. Others said they used music as white noise to calm over stimulated clients, or clients with behavior problems.

*Focus.* Many of the responses stated they use music to encourage attention and participation, and it tends to engage the client. The following is an example of what one participant said: “I use music as a way to get the child I'm working with involved and motivated in our therapy session.”

*Vocalization.* Numerous responses stated they used music to elicit spontaneous verbalizations. One participant reported using music for “Verbal and motor imitation, labeling. Sequencing. Vocalization.”

*Language.* Music was used to teach specific language concepts, help with language memory, elicit language after a CVA, and improve expressive language. An example can be seen in this participant’s response: “Assisting the patient in using language. Causing patient to feel more successful in their speech and not think about their deficits as much. Teach them that melody can sometimes assist in expression.”

*Vocabulary.* Expanding vocabulary for both children and adults was described by several participants. One participant stated, “With language impaired clients, I use music as a mode to teach vocabulary and thematic concepts in a way that is fun and easier for them to commit to memory and use.”

## Discussion

The purpose of this study was to investigate the inclusion of music in speech-language therapy. The results illustrate that music therapy is widely used by SLPs across a variety of work settings, experience levels, and disorder types. Most of the time it appears to be used with very young children, particularly those with autism or developmental delays. It is also used with older people, particularly those who have experienced a stroke or are struggling with aphasia. Music seems to be more common in school settings, clinics, and home environments. When music is used in therapy, it is often used to promote calm, focus, attention, and participation. It is also used to teach language concepts, expand vocabulary, and encourage vocalizations. These results suggest music is used in a variety of ways by working SLPs that can be linked to the research literature on this topic. What follows is a discussion of the research findings as they relate to the literature that was reviewed.

Studies in the review of the literature suggested auditory stimulation was beneficial to the processing capabilities in the brain, which then improved behavior, self-regulation, and more (Vargas-Colon & Villasenor, 2012). Results from this study supports Vargas-Colon and Villasenor's conclusion as two of the main themes found in response to item 10 (see Appendix B) were calming and focus. Another study by Gooding (2011) suggested music could be used to improve social skills such as the ability to work in a group. Again, the current research supports this, as several responses to item 10 (see Appendix B) noted music was used for joint attention and turn taking. According to a study by Hoskins (1988), children ages two to five showed significant post-test improvements on a melodic version of the Peabody Picture Vocabulary Test. This

suggests music may improve comprehension and retention of vocabulary. The current research supports this as well. Many responses to item 10 (see Appendix B) detailed the use of music to help their clients learn new vocabulary or help with language memory.

The literature also intimated uses for music when working with stroke patients. One of the techniques mainly associated with therapy for stroke victims was Melodic Intonation Therapy (MIT). MIT used music and melodic speaking to engage the right hemisphere of the brain in the hopes that it would encourage the damaged left hemisphere to recover and build on whatever speech skills remain intact (Fox & Rau, 2009). No participants in this study specifically reported using MIT in their therapy sessions for stroke patients, however several responses to item seven (see Appendix A) revealed that participating clinicians who used music with adults were working with those recovering from a stroke. In addition, the qualitative responses on the questionnaire indicated that music was used with a stroke patient. Specifically, one clinician in response to item 10 (see Appendix B) stated s/he uses music with clients who have had strokes, to improve expressive language, lengthen phrases, and work on fluency. The same clinician pointed out that music does not always work well with stroke patients, particularly if they have receptive aphasia, as their auditory comprehension may be compromised.

Music is extremely valuable and can be used for many purposes in speech-language therapy for clients of all ages, in all settings, with a variety of disorders. It has wide implications across the field of communication disorders. From promoting attention and focus, to learning vocabulary, to working on language skills, music has been shown time and again to be an effective tool.

## **Limitations**

There are several limitations of this study that impact the results. The most significant would be that there was no question addressing different kinds of professionals, for example music therapists, occupational therapists, audiologists, etc. The survey was distributed to SLPs using a list serve, as well as a list serve of Auditory Verbal Therapists (AVTs). Because there was no question to specify the profession of the participants, there is no way to know if music is used more by SLPs versus AVTs or if the SLPs who participated were also AVTs.

Another limitation is the lack of a question addressing the type of music used in therapy. As stated in the literature review, different types of music affect the brain differently i.e. classical vs. rock music (Adalarsu, Geethanjali, Jagannath, & Naidu, 2011). It would be helpful to know what type of music was used when calming a child, or teaching new vocabulary, or encouraging spontaneous vocalizations. What type of music works well to focus a group and what causes more chaos? These are questions that were not asked, and thus limit the study.

## **Future Directions**

Given what an interesting topic this turned out to be, and how current and relevant it is to the speech language pathology profession, this study could easily be expanded. Another survey could be conducted reaching out to not only SLPs, but all professionals who work with children and adults with special needs, to see how wide the reach of music in therapy is and how effectively it is being used.

One could also refine how music is being used with goals and objectives for treatment. Though literature seems to indicate as much use for music with adults as with

children, the clinicians who participated in this study did not report using music with adults, especially older adults, as much as those clinicians working with children. This question could be further explored in a future study.

## References

- Adalarsu, K., Geethanjali, B., Jagannath, M., & Naidu Keerthiga Ramesh, S. (2011). A review on influence of music on brain activity using signal processing and imaging system. *International journal of engineering science and technology*, 3 (4), 3276-3282.
- Aichert, I., Liss, J., Smith, A., Staiger, A., & Ziegler, W. (2012). Apraxia of speech: Concepts and controversies. *Journal of speech, language, and hearing research*. 55 (5), 1485-1501.
- Baum, S. R., & Zatorre, R. J. (2012). Musical Melody and Speech Intonation: Singing a Different Tune?. *PLoS Biology*. 10 (7), 1-7.
- Bertolinelli, M., Gialanella, B., Lissi, M., & Prometti, P. (2011). Predicting outcome after stroke: The role of aphasia. *Disability and rehabilitation*. 33 (2), 122-129.
- Bethoux, F., Boissy, A., Chemali, K., Conklyn, D., Novak, E., Smith, A., & Ziegler, W. (2012). The effects of modified melodic intonation therapy on nonfluent aphasia: A pilot study. *Journal of speech, language & hearing research*. 55 (5), 1463-1471.
- Bidelman, G., Hutka, S., & Moreno, S. (2013). Tone language speakers and musicians share enhanced perceptual and cognitive abilities for musical pitch: Evidence for bidirectionality between the domains of language and music. *PLoS ONE*. 8 (4), 1-11.
- Bråten, S. (2008). Intersubjectivity enactment by virtue of altercentric participation supported by a mirror system in infant and adult. In F. Morganti, A. Carassa, & G. Riva (Eds.), *Enacting Intersubjectivity* (pp. 133-147). Amsterdam: IOS Press.



- Conway, T., Crosson, B., Harnish, S., & Menizer, M. (2011). Recent developments in functional and structural imaging of aphasia recovery after stroke. *Aphasiology*, 25 (3), 271-290.
- Farbood, M., Marcus, G., & Poeppel, D. (2013). Temporal dynamics and the identification of musical key. *Journal of Experimental Psychology. Human Perception & Performance*. 39 (4), 911-918.
- Fitch, M., (1931). Speech and music development of a one year old child. *Child development*. 324-236.
- Fox, L., & Rau, M. (2009). Treatment approaches to aphasia: Contributions of VA clinicians. *Aphasiology*. 23 (9), 1101-1115.
- Gooding, L. (2011). The effect of a music therapy social skills training program on improving social competence in children and adolescents with social skills and adolescents. *Journal of music therapy*, 48 (4), 440-462.
- Haynes, W. O. & Pindzola, R. H. (2007). *Diagnosis and evaluation in speech pathology*, 7<sup>th</sup> edition. Boston, MA: Pearson.
- Hoskins, C. (1988). Use of music to increase verbal response and improve expressive language abilities of preschool language delayed children. *Journal of Music Therapy*. 25, 73-84.
- Janata, P. (2003). Jazzing Up Neuroscience. *Nature*. 426 (6965), 386.
- Kouri, T.A. & Winn, J. (2006). Lexical learning in sung and spoken story script contexts. *Child Language Teaching & Therapy*. 22 (3), 293-313.

- Levitin, D. J., & Tirovolas, A. K. (2009). Current Advances in the Cognitive Neuroscience of Music. *Annals of the New York Academy of Sciences*. 1156, 211-231.
- Lim, H. A. (2011). *Developmental speech-language training through music for children with autism spectrum disorders: Theory and clinical application*. London: Jessica Kingsley Publishers.
- Madsen, S. A. (1991). The effect of music paired with and without gestures on the learning and transfer of new vocabulary: Experimenter-derived non- sense words. *Journal of Music Therapy*. 28, 222–30.
- National Institutes of Health. (2013, February 28). NINDS stroke information page. Retrieved from National Institute of Neurological Disorders and Stroke website: [http://www.stroke.ninds.nih.gov/disorders/stroke/stroke.htm#What\\_is](http://www.stroke.ninds.nih.gov/disorders/stroke/stroke.htm#What_is)
- Paul, R. (20013). *Language Disorders from Infancy through Adolescence, 4<sup>th</sup> Edition*. City, state: Mosby
- Vargas-Colon, K., & Villaseñor, R. (2012). Using Auditory Stimulation with Students and Lavelle School for the Blind. *Journal of Visual Impairment & Blindness*. 106 (9), 564-567. (<http://www.musictherapy.org/about/history/>)

## Appendix A

### Questionnaire

1) Level of Education

2) Years Working as an SLP

3) What locations have you/are you working in as and SLP? (Check all that apply)

- Homes
- School
- Private practice
- Clinic
- Hospital
- Nursing home/assisted living

4) Age of Clients you've worked with (check all that apply)

- Young Child (0-5)
- Child (6-17)
- Adult (18-74)
- Senior Adult (75+)

5) How often do you use music in general with your clients?

- Seldom
- Sometimes
- Often

6) Type of client you use music with (check all that apply)

- Language
- Speech
- Voice

7) If you work with adults, what disorders do you use music with? (Check all that apply).

- Aphasia
- Apraxia

- Dysarthria
- Stroke
- Hard of Hearing
- Other

8) If you work with children, what disorders do you use music with? (Check all that apply).

- Autism
- Developmental Delays
- Specific Language Impairment
- Other

9) When music is used to reach therapy goals, how often do you use it with a specific client?

- Every session
- Daily
- Weekly
- Monthly

10) What are you trying to achieve when you integrate music into your treatment? (Text box)

## Appendix B

### Qualitative responses to item 10

- To increase the number and types of sounds/words the child uses by engaging them in a fun way that is a part of a predictable routine
- Rhythm, intonation, fluency-confidence!
- I use it with a child that has a sensory disorder and music calms her.
- Calm the child.
- Language
- Calming or white noise
- Verbal and motor Imitation, labeling. Sequencing. Vocalization
- Optimal pitch for speaking voice. Syllabic accent in accent modification
- Usually when using music in a session I use it to highlight intonation, create familiarity and routine or to boost memory of a new skill. Most commonly I use music in the form of simple songs
- Requesting music by selecting the picture exchange symbol, requesting "more" to continue music with picture exchange/switch device or indicating music preference by using yes/no with picture exchange when music selection is provided briefly.
- Assisting the patient in using language. Causing patient to feel more successful in their speech and not think about their deficits as much. Teach them that melody can sometimes assist in expression.
- Usually with recall of rote memory and sentence/phrase completion

- Transitional cues, teach/target receptive and expressive language concepts, encourage attention and participation, target eye contact, target use of gestures/sounds, target imitation, target speech sounds
- Rhythm and familiarity of the music and song. Episodic memory , songs bring back memories
- Increased language skills
- Helping the client connect to the material for better memory/recall of the items taught
- I use music as another modality for teaching language concepts to children with a variety of impairments. I have found that children with speech disorders benefit because it takes the stress off of their articulation and allows them to focus more on what they are communicating. With language impaired clients, I use music as a mode to teach vocabulary and thematic concepts in a way that is fun and easier for them to commit to memory and use.
- Fun, more relaxed therapy session with children. It also relaxes adult patients and will often elicit language after a CVA.
- Improving expressive language, turn taking, socialization, etc.
- Participation. Increase in verbalizations
- Increased engagement, vocalization, automatic speech, reminiscence
- I've found that using, say the same song for body parts, helps a child to remember the body parts.

- Vocabulary enrichment Help kids remember information that will help them in class. These may include things like songs to help remember certain rules of grammar, songs to help remember how much coins are worth, or spelling rules.
- My clinic uses therapeutic listening with many clients to help them integrate their sensory systems, to help them calm themselves, achieve a higher level of organization, etc. This is done under the direction of one of two therapists certified in TL. Otherwise, I have used music in general - kids music - to teach sounds / environmental sounds to children with hearing impairment, or to elicit verbalizations, or to teach specific language concepts (body parts, spatial, animal sounds, colors, etc). I also use it with some of my children with autism who like music; it helps them engage and have better eye contact.
- With aphasia, automatic speech and melodic intonation. With right CVA and autism, right hemisphere activation, prosody, and emotion (identifying and producing). With speech, prosody and emotion.
- Imitation of intonation, word production, vocabulary building, joint attention
- Improve memory. Promote fluent speech.
- I am currently working with preschool children and I find that those who have difficulty speaking may find it easier to sing along than saying words without it.
- More functional communication
- Expressive Language or Fluency
- I use music as a calming tool for overstimulated children as well as a means of eliciting more expressive language from children.

- Increasing engagement/interaction, encouraging imitation, turn taking, choice making, spontaneous vocalizations.
- imitate movements for increased language imitation and development
- Typically it as icon for the child to select to request a song. The child is learning to request from up to 5 icons (one of which is music). The children I use this with have severe autism.
- We use finger plays to work on imitation skills with children with autism.
- It depends on the client. Sometimes I've used music to demonstrate the presence of the ability to speak in stroke patients. With DD clients, to gain attention in therapy, to enhance the time in therapy aka make it fun! With clients with autism, it depends on the individual client. As the saying goes, "you've seen one client with autism; you've seen one client with autism."
- Goals vary; sentence structure/ auditory memory/ vocabulary expansion/ articulation
- I use music as a calming agent during sessions. My kids who demonstrate difficult behavior seem to respond best to music.
- In my 0-3 speechies I am trying to get participation and interaction, vocalizations, body movement, sound awareness, eye contact and introducing them to rhythm and rhyme. I use music as a distraction during oral motor treatments and feeding. I use music to have fun and get the child ready for therapy. I use music to provide breaks. I love music in therapy.



- Autism-joint attention, initiation, socialization Phonology-increase listening skills, practice a variety of sounds in a fun way Developmental delays-learn a variety of concepts Language impairment-vocabulary
- For me, music has been used as a reward or enticement (i.e. using music box with Picture Exchange Communication Systems)
- Natural sounding speaking voice-matching inflection, high/low pitch Using singing to better hear speech/language targets Use singing to increase length of utterance Use music to engage young children
- Movement, sustained attention, rhythm, memory improvement.
- In my experience, I have found that music is a wonderful tool in increasing expressive language functioning in patients that have had strokes. Music is very helpful in increasing length of phrases as well as fluency with speech production. It is more difficult though with patients with receptive aphasia. I found that it does not work as well, as patients with reception aphasia have difficulty with auditory comprehension.
- Improved communication and/or cognitive processing for increased QoL.
- awareness of sound, early language goals, recognizing that sound has meaning
- To increase functional communication with low level dementia and Alzheimer's patients. Increase participation and possible verbalizations.
- I am trying to integrate different modalities when I use music. Listening, speaking and hearing modalities are integrated to help with comprehension and retention of information.

- Changes in prosody. Developing auditory pathways. Speed and accuracy of articulation. Developing auditory feedback system. Developing auditory discrimination skills.
- Memory facilitation, pacing for intelligibility during co articulation, etc
- Relaxation; sensory integration
- Repeating Rhythm Fun Clear Speech
- Decrease agitation, promote calmness and nostalgia
- I use it usually as a reinforcer for nonverbal students. I use PECS a lot and if it is something they really like then I make an icon for it.
- Children: acknowledge musical stimuli for auditory comprehension Adults: recalling words/information
- I use music as a way to get the child I'm working with my involved and motivated in our therapy session.
- I pair a song with a particular routine, such as a visual schedule. I might also use a song to help with language memory.
- Autism-Joint attention ; requesting; Language/developmental delay: labeling, concepts, imitation Adults: to begin speech skills after stroke; dementia- memory
- Recall. Pitch. Fluency. Articulation. Prosody.

December 18, 2013

MEMORANDUM

TO: Torry Farnell  
Fran Hagstrom

FROM: Ro Windwalker  
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 13-12-330

Protocol Title: *The Inclusion of Music in Speech-Language  
Pathology Interventions*

Review Type:  EXEMPT  EXPEDITED  FULL IRB

Approved Project Period: Start Date: 12/16/2013 Expiration Date:  
12/15/2014

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Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

**This protocol has been approved for 100 participants.** If you wish to make any modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or [irb@uark.edu](mailto:irb@uark.edu).