

EFFECTS OF SINGING ON SPEECH PATTERNS OF CHILDREN  
WITH EXPRESSIVE LANGUAGE DELAYS

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A THESIS

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FOR THE DEGREE OF MASTER OF ARTS  
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COLLEGE OF ARTS AND SCIENCES

BY

SHERRI Y. ROSS, B.S.

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DENTON, TEXAS

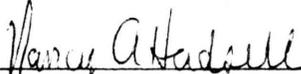
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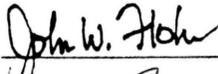
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To the Dean for Graduate Studies and Research

I am submitting herewith a thesis written by Sherri Y. Ross entitled "Effects of Singing on Speech Patterns of Children with Expressive Language Delays." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Music Therapy.

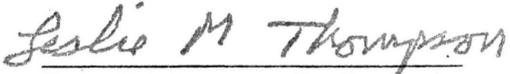
  
Major Professor

We have read this thesis and  
recommend its acceptance:


  
Chair, Department of  
Performing Arts

Accepted:

  
Dean for Graduate Studies and  
Research

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Above all, thanks to my husband, my family, and to Him who provides the ability and wisdom to learn.

Effects of Singing on Speech Patterns of Children with  
Expressive Language Delays

Sherri Y. Ross, B.S.

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Abstract

The purpose of this study was to determine the effect of singing sounds on the expressive speech patterns of children with language impairments. The design was a multiple baseline across three behaviors with replication across three subjects. Participants, ages 3-5, were chosen in consultation with the speech therapist who also served as the secondary observer. Data for baseline and follow-up were taken by videotaping the participants in the classroom before and after each music therapy session. Data were gathered in the same manner for the intervention phase while also videotaping the intervention activity in the music therapy session. Songs were implemented during intervention that focused on the sounds /M/, /P/, and /B/. Data were graphed using frequency recording and reliability was calculated using the formula for point-by-point agreement.

Two students demonstrated significant upward trends during intervention for all behaviors both in the classroom environment and in the music therapy session. One student showed a decrease during intervention, but increased during follow-up. Most behaviors did not occur in baseline, but all were occurring during follow-up with the exception of one student who was absent. This study does show a change in behaviors for all participants.

## TABLE OF CONTENTS

ACKNOWLEDGMENTS.....	iii
ABSTRACT.....	iv
LIST OF FIGURES.....	vii
Chapter	
1. INTRODUCTION.....	1
Definitions.....	4
Limitations.....	5
Purpose of the study.....	6
2. REVIEW OF LITERATURE.....	7
Speech/Language Development.....	7
Music Therapy and preschoolers with Developmental Disabilities.....	9
Music, Language, and Early Childhood.....	11
3. METHOD.....	16
Participants.....	16
Design and Procedures.....	19
Research Questions.....	22
4. RESULTS.....	23
Student J.....	23
Student C.....	23
Students T.....	26
5. SUMMARY, DISCUSSION, AND RECOMMENDATIONS.....	28
REFERENCES.....	32

APPENDIX

A Intervention songs.....36

B Consent form for guardian of participants.....37

C Consent form for classroom teacher and  
school principal.....38

D Consent form for guardian of other children  
in the classroom.....39

## LIST OF FIGURES

### Figure

1. Data for student J.....	24
2. Data for student C.....	25
3. Data for student T.....	27

## CHAPTER 1

### Effects of Singing on Speech Patterns of Children with Expressive Language Delays

Communication is an essential part of life for human beings. A child begins to grasp the concepts of speech and language by the age of 18 months. However, sometimes this process becomes delayed, and speech and language problems may occur. Language delays in children can occur in one or both of these areas: receptive and expressive. Receptive language is communication, spoken or otherwise, that has been received by the child. Expressive language is the production of meaningful sounds or utterances (Michel & Jones, 1991).

Music can be an effective means of remediating various speech impairments. Speech and music sounds are processed differently in the brain. As evidenced by various types of research, most musical skills are processed in the right hemisphere of the brain. However, evidence exists that indicates some musical skills related to language are processed in the left hemisphere (Springer & Deutsch, 1993). Musicians who have suffered left hemisphere strokes have acquired impairment of some language-related skills, such as writing and taking dictation of music. However, most musical skills, such as recognizing melodies, recognizing mistakes in performed music, and other auditory musical skills, remained intact. Also, patients who suffer left hemisphere strokes are often unaffected in their abilities to sing and to recognize familiar songs. Some studies have also indicated that those who suffer right hemisphere strokes often retain speech learning skills while musical skills become impaired. Furthermore, those

who suffer left hemisphere damage show impairment in comprehending word meanings, or semantics, while those with right hemisphere damage show no similar impairments.

A type of therapy involving musical skills used with clients who suffer language impairments is melodic intonation therapy (MIT). Essentially, this type of therapy is used to teach phrases through song. This technique has been successful with those possessing good receptive language but poor speech production. Word sequences are first incorporated into song; the melody is then gradually de-emphasized until the client can speak the phrase without singing. The reasoning behind this type of therapy is that the intact right hemisphere learns phrases through song and develops more language production skills which can compensate for the left hemisphere deficit. This leads to the use of singing in music therapy as a way to improve communication and develop language skills. Whether used with adults or children displaying language impairments or delays, singing can be quite useful in learning language.

The voice is a natural, built-in musical instrument. Singing can involve other skills, such as perception, cognition, and expression. Singing can also encourage social development and strengthen social relationships. No culture yet discovered has been without music and some type of singing. It is undoubtedly a powerful form of communication, and when used in the context of learning language, has proven successful with a diversity of populations.

Most children have been exposed to singing, either passively or actively, by

the time they reach 4-5 years of age. Many classroom teachers use singing activities to teach certain concepts, and many music therapists work in public school settings using singing to work on certain receptive and expressive skills. One music therapist, while leading a continuing education seminar, recounted an experience of working with a totally nonverbal child who spoke the consonant “b” for the first time while the therapist was singing a song about a sound a drum makes— “boom” (D. Dacus, personal communication, December, 12, 1996). Many other music therapists have described similar experiences, but the concept of developing expressive language skills through music therapy has not been investigated or documented in a research format, nor have many specific experiences been formally described. Aside from specific language delays, other factors, such as various forms of mental retardation, physical impairments, other nonspecific health impairments, or those that may not yet be diagnosed, can affect the development of speech and language in children. Clearly, this is an area that needs to be explored and researched for specific and useful information.

The present study targets music therapy’s effects on the improvement of articulation, an area of expressive language development. Articulation difficulties are evident when one produces distorted sounds, such as omissions, substitutions, or disfluent sounds. By age five, children usually express all speech sounds except for consonant blends. These sounds include all vowels and the consonants h, w, hw, (as in “what”), p, b, m, t, d, n, k, g, ng, j, f, and v (Blumberg,

1975).

A child with a language delay may express frustration and/or lack of motivation for participating in speech exercises. Any kind of therapy is a gradual process and can be frustrating, especially for children under the age of five who may not clearly understand the process. Even when activities of speech therapy are modified appropriately for this age group, repetition of speech patterns can be tedious for small children, and concentration may be difficult to maintain.

Singing can reinforce speech therapy goals and facilitate concentration and learning of communication in children with speech impairments (Cohen, 1994).

Singing and speech both possess the aspects of frequency, range, rate, rhythm, intensity, and diction. Also, every song contains rhythmic structure which may be easier to imitate and maintain than the rhythm of speech alone. Few studies have investigated the effects of singing on bilabial speech patterns in three to five year old children with expressive language delays. This is an interesting area since singing has been effective in improving receptive language and different aspects of expressive language.

### Definitions

The following definitions clarify primary terms in this study.

Music Therapy- The use of music in the accomplishment of the therapeutic aims of restoration, maintenance, and improvement of mental and physical health. It is the systematic application of music, as directed by the music therapist in a therapeutic environment, to bring about desirable changes in

behavior or learning patterns (Davis, Gfeller, & Thaut, 1992).

PPCD- Preschool for children with disabilities. Children are ages 3-5 and enrolled in public school (Texas public schools).

Delayed language and development- Speech is not developed at an average rate in relation to mental capacity, experience, and motivation of the child (Webber, 1981).

Speech Pathology-This is defined in the handbook of the State Board of Examiners for Speech-Language Pathology and Audiology. The definition reads..."the application of non-medical principles, methods, and procedures for the measurement, testing, evaluation, prediction, and counseling, habilitation, rehabilitation, or instruction related to the development and disorders of communication, including speech, voice, language, oral pharyngeal function, or cognitive processes, for the purpose of rendering evaluation, prevention, or modification of these disorders in individuals" (Article 4512j, Chapter 381, 68<sup>th</sup> Legislature, 1983, p.1).

#### Limitations of the study

This study will involve only children with speech and language delays and not children with other speech or language disorders, such as stuttering or voice disorders. Results may not be representative of all such children with speech or language delays. Within the design there will be differences in time and day of sessions, room temperatures, and locations. In addition, specific diagnoses have been assigned to only one of the subjects. This subject is diagnosed with Down's

Syndrome. Of the other two subjects, one shows autistic characteristics and the other shows signs of cognitive developmental delays.

Purpose of the study

The purpose of this study is to determine the effect of singing sounds on the expressive speech patterns of children with language impairments. Data will be recorded by the music therapist with the speech therapist as secondary observer. The design will be multiple baseline across three behaviors with replication across three subjects.

## CHAPTER 2

### Review of Literature

#### Speech/Language Development

Varied social interaction can be an essential part of developing language in children with expressive language delays. Falco (1987) investigated the role of social linguistic environment in children's language development. Children with expressive language delays tended to increase the frequency of their responses if language was varied in the social environment. Verbal interactions increased during storytime consisting of reading picture books and during a period of verbal interaction between parent and child. The author emphasized the social interaction processes involved in the development of language.

Another study suggests that some children with developmental disabilities may possess a language impairment that accompanies the primary diagnosis. Franke (1990) investigated the comprehension skills of language-impaired children with and without attention deficit-hyperactivity disorder (ADHD). The purpose in this research was to determine the prevalence of attention deficit-hyperactivity disorder in preschool children who also had speech/language impairments. Also, this study compared the comprehension on skills of children with language impairments with and without ADHD. Thirty children who were delayed in receptive and expressive language were tested with three measures of language comprehension—the Peabody Picture Vocabulary Test-Revised (PPVT-R), the Test for the Auditory Comprehension of Language-Revised (TACL-R), and the

Preschool Language Assessment Instrument (PLAI). Fifteen of these children were also diagnosed with ADHD. The researcher was especially interested in whether these children with the dual diagnoses of ADHD and language impairment would demonstrate significant differences in language abilities from those children diagnosed with only a language impairment. Results showed that 48% of the children with language impairments were also diagnosed with ADHD. ADHD was diagnosed for 71% of those children with receptive and expressive language delays, and diagnosed for 42% of the children with only expressive language delays. Of children with impaired speech skills, 12% were also diagnosed with ADHD. A significant difference was found between children diagnosed with ADHD along with a concomitant speech/language impairment and children diagnosed with only a speech/language impairment. Those children diagnosed with ADHD and a speech impairment showed significantly lower functional speech/language skills than those children diagnosed with only a speech impairment. This study indicates that language disorders and ADHD in preschool children may certainly overlap. Also, the presence of ADHD may definitely impair children's ability to understand complex sentences.

A third study (Crooke, 1995) investigated the role of imitation in the movement from single words to multi-word combinations for children with Specific Expressive Language Impairment (SELI). The research focused on finding patterns in the production of imitative two-word utterances. The purpose was to determine how imitation was used to aid the transition from single words

to multi-word combinations. Subjects were eight children diagnosed with SELI who are known by speech pathologists as imitators. Data was collected over a nine-week period and were taken from language samples for each child. Results indicated that patterns of emergence in the imitative utterances were produced by the subjects. Subjects progressed from using less complex imitative utterances to using more complex imitative combinations. Subjects also began imitating *harder* semantic relations more than the *easier* functional relations. This study suggests that some children diagnosed with SELI may use imitative utterances as a means to move from single words to multi-word combinations.

#### Music Therapy and Preschoolers with Developmental

#### Disabilities

Music has been effective in increasing functional skills in children with developmental disabilities. One study on this subject (Aldridge, Gustorff, & Neugebauer, 1995) explored the effects of music therapy on developmental changes in developmentally delayed children. Five children (ages 4-6 years) were tested in the areas of locomotor development, personal/social development, hearing and speech development, hand-eye coordination, performance tests of cognitive skills, and practical reasoning. The areas tested served as the dependent variables, and the musical activities served as the independent variables. Results indicated that music did have a positive effect on developmental changes in the children in these areas.

Another study researched the validity of Music Therapy Functional Skills

Assessment for students in public school. This assessment was developed by Gleasman (1995) for use in Texas public schools to determine interpersonal, communication, music, and movement skills. Inter-observer reliability was established in this study by comparing subject scores recorded by different observers. Students with disabilities scored lower on the assessment than students without disabilities. If studies show that singing has some positive effect on speech patterns in children with language delays, this assessment may be updated in the area of expressive language and could be more effective in achieving its purpose.

Research has also been conducted investigating the use of musical improvisation with children with developmental disabilities. One such study (Orsmond & Miller, 1995) researched the differences in musical characteristics of free improvisations in children with developmental disabilities who were musically inclined. Another group of children, matched for cognitive level and chronological age, served as the control group. Behavioral and cognitive measures that correlated with musical sophistication were administered. The group that was musically inclined produced more organized and sophisticated explorations on the keyboard. The higher level of musical structure was first associated with fewer interfering behaviors and later with practice and spatial task performance. This study implies that children with disabilities do have inclinations towards musical activities. This interest can translate into actual ability and a higher level of musical organization. These abilities can be useful

with children sensitive to spatial concepts within specific music and movement activities that stimulate learning through environmental and self exploration.

### Music, Language, and Early Childhood

Harding (1989) investigated the relationship between music and language in early childhood. This study was conducted in Montana public schools to focus on the relationship between the amount of musical experiences in early childhood and language achievement. Scores were recorded for mechanical language, expressive language, reading, and spelling. Gender was also of interest, so a two-way analysis of variance was applied using both gender and musical experience as the independent variables. Only mechanical language showed no relationship to musical experience. A strong relationship was found between musical experience and the skills levels of skills in expressive language, reading, and spelling. Also, girls in this study received more musical experience than boys.

Another study (Well, 1989) investigated the effects of music therapy on the development of specific language skills in language-delayed preschoolers. Singing was used to reinforce and increase language skills. However, treatment implementing the music and language techniques lasted only four sessions. Results found no significant effect on the development of targeted language skills for the four male children. This study may have produced a significant effect if the treatment phase had been longer. When attempting to promote language development in children, it is perhaps a good idea to extend the treatment period.

Other studies investigating children, music, and language have showed significant results using music to enhance specific language skills. One such study (Hoskins, 1988) researched the use of music to increase verbal response and improve expressive language skills of preschool children who were diagnosed with a language delay. In this study, 16 children with mental retardation and developmental delays were given the Peabody Picture Vocabulary Test (PPVT) and the Expressive One-Word Picture Vocabulary Test. The PPVT was also given in a melodic version. After a pretest, subjects participated in group music activities that emphasized expressive language skills. A strong relationship between the spoken and melodic versions of the PPVT was demonstrated. A significant improvement in PPVT melodic test scores was found in the pre- and post-test analysis, which would indicate that the group music activities were beneficial.

A third study (Gillis, 1980) researched the usefulness of Musical Approach to Remediate Speech (MARS) in improving production of one phoneme and features of pitch, rhythm, time, and loudness in the speech of two children with speech apraxia. In this study, ten familiar lyrics were paired with ten phonemic drill steps. The clinicians systematically trained breaths per lyric, increased speed, rhythm, pitch, time, and loudness. The lyrics were arranged in ascending degree of difficulty with lyric one being the easiest and lyric ten being the most difficult. Measurements were taken before treatment, after three weeks of treatment, and after the MARS treatment, using spontaneous speech samples

and the McDonald Deep Test of Articulation. No significant differences were found in phoneme production on pre, interim, or post-testing. A significant improvement in spontaneous speech was found in both subjects' phoneme productions. Also, a significant improvement was found in subject one's articulation. However, no significant improvement was found in the spontaneous speech samples of subject two. This research shows that a specific musical approach (MARS) can have a positive effect on the production of speech in children with apraxia. Also systematic training of certain skills paired with musical stimulation can have a significant effect on spontaneous speech.

Most research investigating music therapy and speech/language is documented in the form of quantitative data. However, one study researched the process of music therapy with a five-year-old boy who had been born prematurely. He had little speech and was developmentally delayed in the speech/language area. The therapist reported on his progress in music therapy and speech/language development. The therapy process was divided into four main areas: discovery, play, fears, and the verbal world. In the discovery phase, the boy discovered a sense of shape in the music between him and the therapist. His playing changed from unpredictable outbursts to creative phrases which had a clear beginning, middle and end. Toward the end of this phase, the boy started forming spontaneous simple sentences. During the play phase, the boy was allowed to play with his voice and explore his own musical boundaries through playing instruments such as the kazoo. At the same time, his speech therapist started

working on expanding the boy's spoken phrases and preparing for syntactical usage. The vocal play in music allowed him to explore and expand speech sounds along with practicing this skill in speech therapy. In the fears stage, the boy had slept away from home for the first time and brought visions of a scary monster to his session. Upon his request, the therapist played scary music and the boy played the instruments in a strong, disorganized way. He vocalized and shouted to the monster to go away. This stage may have helped him to express his emotions using his words, and through the music to express his fright safely. In this way, he also brought his internal world out and liberated some tension. In the final stage, the verbal world, the boy started organizing his sessions. He made up concerts in which he narrated to an imaginary audience. In speech therapy he was working on moving from concrete to abstract levels of language. The boy revealed his needs through the concerts and experienced musical growth at the same time he was experiencing growth in his language. At the end of two years, the boy had a larger vocabulary and was relating his music therapy sessions to the outside verbal world. This study certainly suggests that music can aid in the development of speech/language and help one to learn safe, appropriate ways to communicate. It also suggests that children can benefit from specific musical activities that help them to explore the voice.

All of these studies show that music can certainly have a positive effect on the development of speech and language skills in children. Some of the studies investigated expressive language development in children and showed that

a speech impairment may accompany the primary diagnosis and that social interaction can play a major role in the development of expressive language skills. Other studies showed that music has been effective in increasing other developmental skills in children with various disabilities, and that most children have a natural affinity for music which makes it a good avenue for learning and increasing certain skills. A few of the studies focused on music used to increase language skills in young children. These studies found significant relationships between musical experiences and language skills in early childhood. Within research, music activities have also been used in conjunction with certain evaluation tests developed for specific developmental skills in children. Music has been proven beneficial in this area. In other studies, music has been used to increase development of safe and appropriate exploration and communication within a child's environment. All of these studies have investigated speech/language or music and speech/language in some form. However, none of these has researched the effects of singing on specific expressive articulation behaviors in young children with language impairments or delays. These studies do document that music can certainly be a positive force in learning and developing specific skills in children with developmental disabilities. The present study ventures one step further to investigate the effects of music on specific expressive language behaviors in children with speech impairments.

## CHAPTER 3

### Method

#### Participants

Participants for this study were three children with speech and language delays enrolled in public preschool for children with disabilities (PPCD). Three children, ages three to five, were chosen from two different PPCD classrooms at two different elementary schools. Both classrooms were classified as nonverbal because most of the children in these classes had either no speech or severe speech impairments. The selection process was based upon the recommendations of the behavioral analyst and the speech therapist who work with the PPCD classrooms, speech assessments obtained from the Individual Education Plans, and the availability of the children for music therapy sessions. All of the subjects chosen have received music therapy services for 30 minutes a week since the beginning of the school year. The present researcher is the music therapist for the school district and has served as the music therapist for these children. As a result, the children already knew the researcher and had been participating in music therapy activities; however, the type of singing activities used in this research were not implemented until the researcher started this investigation in the spring semester, 1997.

Participant J was a four-year-old boy who turned five during the study. He had been diagnosed with a severe speech impairment and other developmental delays that were noticed after he contracted meningitis. Participant J has also

received physical therapy, occupational therapy, and speech therapy at school. Other developmental delays included speech, cognitive, and fine and gross motor skills. His speech skills include the abilities to vocalize, to laugh, and to say “bye bye” and “ball”. His articulation has been described by the speech therapist as totally unintelligible. When evaluated using the Vineland Adaptive Behavior scale, this child tested in the range equivalent of an average age of less than one year. However, this evaluation took place when he first entered school at age three, and this is his second year in school. His social score was 63; his motor skills score was 62; his adaptive behavior score was 60; and his communication score was 60.

Student J always smiles and laughs in music therapy. He actively participates choosing and playing instruments, strumming the guitar and omnichord, and performing imitative movement activities with verbal prompts from the therapist. He also makes animal sounds when playing with puppets and vocalizes during songs, movement activities, and while playing instruments. This student can also be uncooperative when being told to wait his turn to strum an instrument or when being asked to let someone else have a turn when he is finished.

Participant T was a three-year-old girl who was also diagnosed with a severe speech impairment and unintelligible articulation, except for the words “mama” and “bye bye”. She also had other delays as evaluated by the Vineland scale. Her communication score was 70; her motor score was 82; her socialization score

was 69; and her adaptive behavior score was 65. Her average score on this evaluation was the equivalent of a child of two years. There is no known etiology for her developmental delays. This was student T's first year in school. She received music therapy and speech therapy, both once a week. This child is generally cooperative and pleasant during music therapy. She vocalizes during all songs and participates by playing instruments, by choosing instruments and other visual aids such as puppets, and by performing simple movement activities with verbal prompts from the therapist. She usually waits her turn to strum an instrument, and she can follow simple one-step directions independently.

Participant C was a five-year-old girl diagnosed with Down's Syndrome. She also was diagnosed with a severe speech impairment. As evaluated by the Vineland scale, her scores were equivalent to those of a child two to three years of age. This student had developmental delays in communication, socialization, and adaptive behavior. However, she was also evaluated with another tool, the Preschool Language Scale. This test yielded an average language age of three years. Her expressive communication score was 65; her auditory score was 69; and her total language score was 63. This student also received speech therapy every day of the week. In music therapy, student C participated by choosing and playing instruments, performing movement activities with verbal prompts, vocalizing with verbal prompts, and following simple one-step directions. However, student C could be uncooperative at times, as evidenced by not

waiting her turn, not letting another student have a turn, hitting another student occasionally, and once or twice, even getting up to leave for no apparent reason. However, these uncooperative behaviors were not consistent in every session.

### Design and Procedures

Three bilabial (spoken by putting lips together) sounds, /M/, /P/, and /B/, were selected in consultation with the speech therapist. The research design for this study was multiple baseline across behaviors (Kazdin, 1982). This included baseline, intervention, and follow-up segments for the three articulation behaviors for each child. Baseline, intervention, and follow-up were all videotaped in order to see the child performing the specific behaviors, and also so the speech therapist and researcher could record data separately. The independent variable in this study was the auditory stimulation or sounds songs. These songs were implemented during intervention and targeted the three sounds /M/, / P/, and /B/. The dependent variables were the frequency and accuracy with which the children uttered the three bilabial sounds.

Baseline included videotaping the students in the classroom five minutes before and five minutes after each music therapy session. During this taping, the children were performing tasks such as looking at books with their teachers, having morning snack, or picking jobs for the day such as being line leader. The children were free to talk as much as possible during any of these tasks.

For each child, as the first behavior stabilized in baseline, the researcher began intervention for that particular sound, while continuing baseline measurement on

the other two sounds. Once production of that sound stabilized in treatment, the intervention was begun on the second sound, while maintaining baseline measurement on the third. Finally, as treatment measures on the second sound stabilized, the intervention was begun on the third sound.

The intervention took place within the regular music therapy sessions. The reason for this was to investigate whether the behaviors would increase with weekly music therapy sessions in a classroom, and to see if these behaviors would carry over to the classroom environment outside the music therapy sessions. If this happened, music therapy would have demonstrated a positive effect on learning expressive language in the classroom.

During treatment, data were taken by videotaping five minutes before and five minutes after the sessions. Each song provided many opportunities for the child to imitate the targeted sound. Each time the child imitated the sound, verbal praise from the therapist and teacher was given. The songs used were: "Farmer Brown's Cow", "Let's Sing a Song", "I Like to Sing About Animals", and "My Favorite Sound" (See Appendix A, B, C, and D). These songs were also selected in consultation with the speech therapist. The first song was chosen from the book Music for Fun. Music for Learning (Birkenshaw, 1982), and the other three were chosen from the book Music for Developing Speech & Language Skills in Children (Michel & Jones, 1991). The intervention took place usually during the second activity of the session. During each session there was a hello song, an instrumental activity, a cognitive activity (numbers, colors, etc.), the

research intervention activity, a group movement activity, and a goodbye song. These activities were not always in this order, but the hello and goodbye song were always at the beginning and the end of the session. The intervention activity itself was also taped so the speech therapist could watch it weekly for data analysis.

Follow-up took place in the same manner as the baseline phase with taping five minutes before and five minutes after the sessions. Both intervention and follow-up also were videotaped during the same types of tasks in the classroom as they were for baseline. The study lasted five months. Data collection procedures involved frequency recording, and a percentage of correct responses was calculated. If the subject uttered a sound correctly, a (+) was recorded. If the subject did not utter a sound correctly, a (-) was recorded. After the researcher took data from the videotape, it was given to the speech therapist for inter-observer data recording. Inter-observer reliability was calculated by comparing subject scores recorded by the researcher with subject scores recorded by the speech therapist using the formula for point-by-point agreement (Kazdin, 1982):

Point-by-point agreement =  $\frac{A}{A + D} \times 100$

Data were graphed using typical multiple baseline format to show any changes in the targeted behaviors for each child. Since this design included a follow-up at the end of the study, the graphs also reflected at reversal at this final phase.

### Research questions

1: Will singing songs targeting the sounds /M/, /P/, and /B/ increase the frequency with which the subjects accurately utter these sounds during the music therapy session?

2: If the target behaviors increase during therapy, will they be carried over to the normal classroom environment?

## Chapter 4

### Results

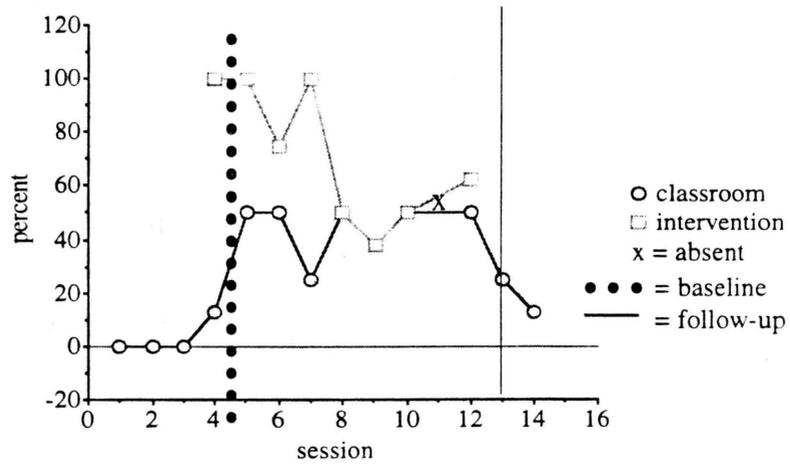
#### Student J

Figures 1, 2, and 3 show data taken in the classroom (solid lines) and during music therapy intervention (broken lines). During baseline, each response showed a level of 0 percent. There was an upward trend for behaviors /M/ and /B/ during the intervention. Both behaviors /M/ and /P/ decreased during follow-up, although they were still occurring in this phase. Behavior /B/ actually increased during follow-up. Inter-observer reliability for /M/ was 97%, for /P/ was 95%, and for /B/ was 99%. Overall reliability for this student was 99%.

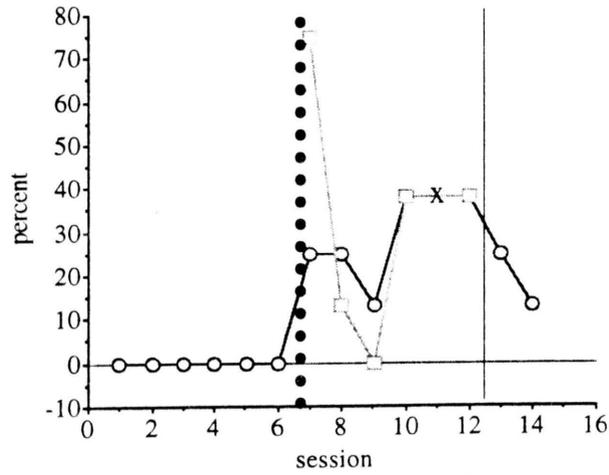
#### Student C

Figures 4, 5, and 6 show data taken in the classroom (solid lines) and during music therapy intervention (broken lines). During baseline, behaviors /M/ and /B/ showed a consistent level of 0 percent. Behavior /P/, however, increased to 25 percent and then decreased to 0 percent where it remained for the duration of the baseline phase. There was a gradual decrease in all behaviors during the intervention phase because behavior modification techniques needed in the classroom for this student involved sending her to time out. However, all three target behaviors increased during follow-up, when no time out periods were needed. During follow-up, behaviors /B/ and /P/ increased to levels above those seen during intervention. Inter-observer reliability for /M/ was 91%, for /B/ was 99%, and for /P/ was 87%. Overall reliability for this student was 93%.

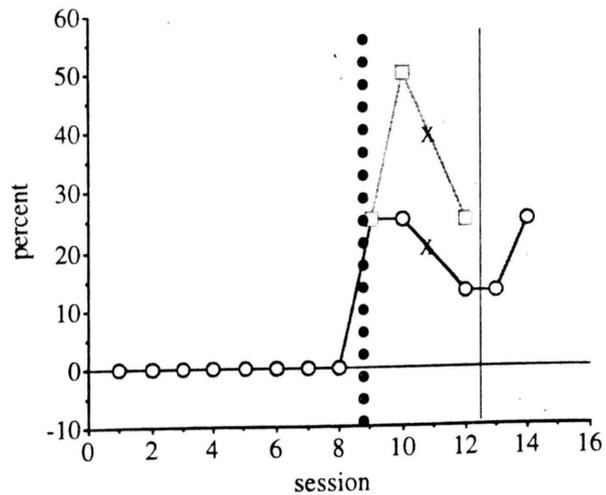
### Student J - Sound M



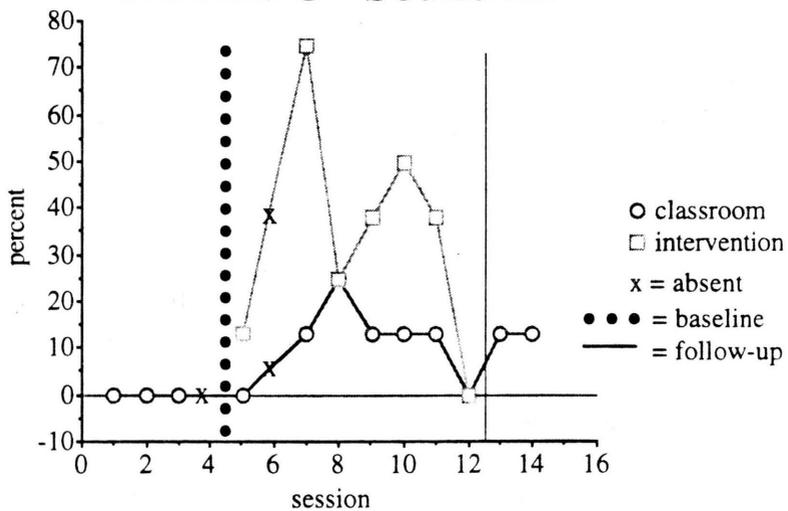
### Student J - Sound P



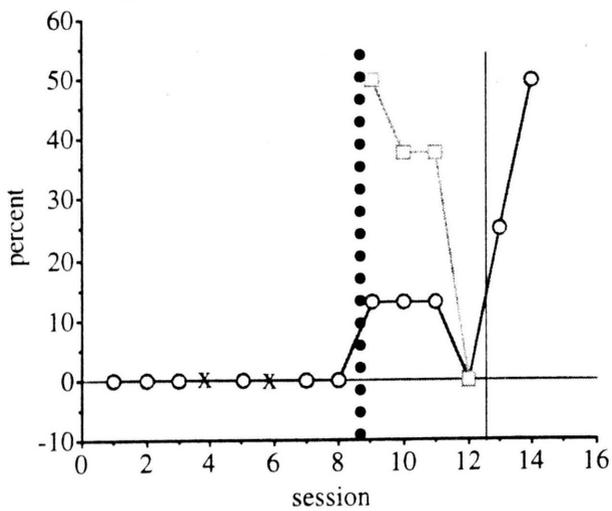
### Student J - Sound B



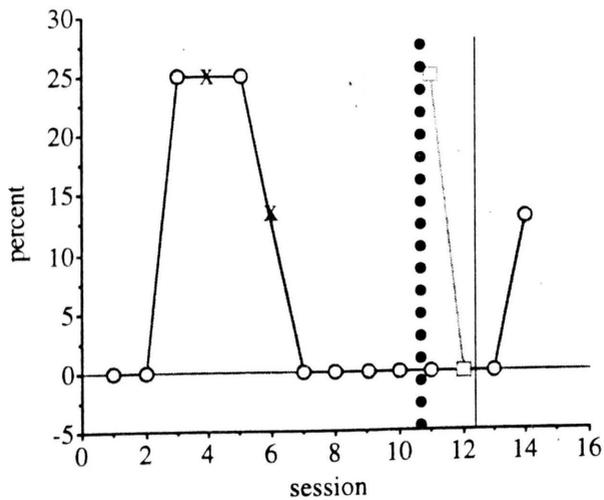
### Student C - Sound M



### Student C - Sound B



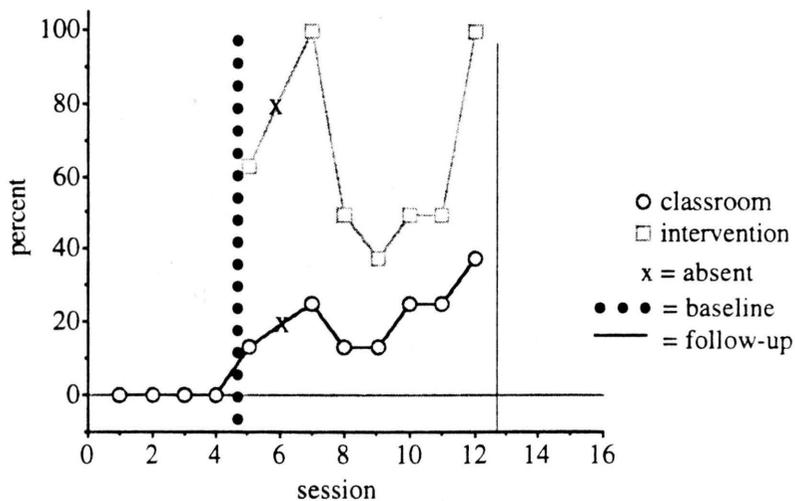
### Student C - Sound P



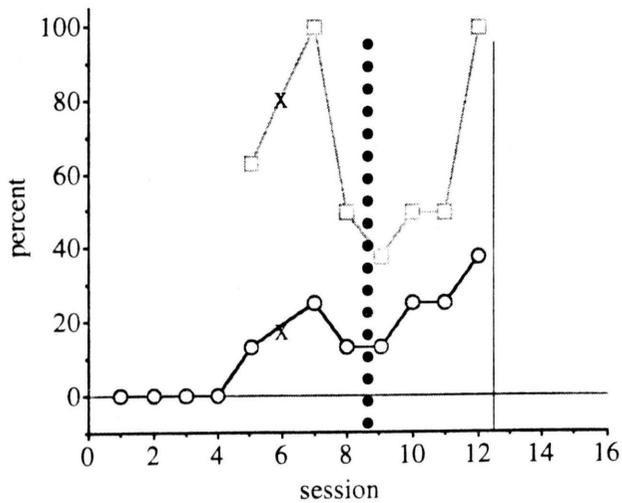
**Student T**

Figures 7, 8, and 9 show data taken in the classroom (solid lines) and during music therapy intervention (broken lines). During baseline behavior /M/ remained at a level of 0 percent; behavior /B/ increased to 13 percent; and behavior /P/ showed a level of 13 percent. During intervention all behaviors showed an increase in occurrences. In the final music therapy session, these occurrences increased to a level of 100 percent. In the classroom, behavior /M/ increased to 38 percent; behavior /B/ increased to 38 percent; and behavior /P/ increased to 25 percent. No data for the follow-up phase with this student is available because she was absent during this time. Inter-observer reliability for /M/ was 97%, /B/ was 96%, and /P/ was 95%. Overall reliability for this student was 96%.

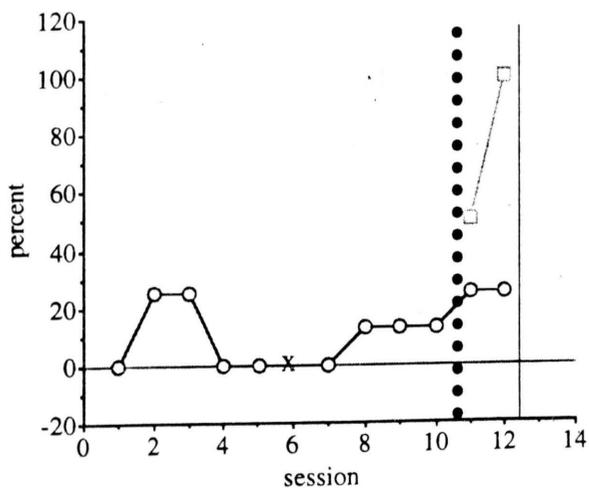
### Student T - Sound M



### Student T - Sound B



### Student T - Sound P



## CHAPTER 5

### Summary , Discussions, and Recommendations

The purpose of this study was to determine the effects of singing sounds on the expressive speech patterns of children with language impairments. The multiple baseline design concentrated on three bilabial speech behaviors; /M/, /P/, and /B/. These behaviors were replicated across three participants, ages 3-5. Each participant was chosen in consultation with the speech therapist who worked with him or her.

Three of the intervention songs were chosen from Music for developing speech and language skills in children (1991), written by two music therapists. The other song was selected from Music for Fun Music for Learning (1982). These songs were implemented in the intervention phase with each participant.

The researcher recorded baseline data by videotaping the participants in the classroom before and after the regular music therapy session. When intervention began with each participant for each behavior, the singing activity in the music therapy session was videotaped as well as the participants' behaviors in the classroom environment before and after the session. Follow-up data recording took place in the same manner as that for baseline, i.e., videotaping before and after the music session which did not include the intervention songs. The speech therapist served as secondary observer taking data from each videotape.

Student J demonstrated an upward trend for each behavior during treatment with a decrease during follow-up. However, these behaviors did occur in the

follow-up phase while they did not occur during baseline.

Student C demonstrated a decline in all behaviors once the treatment phase began. The behavior modification technique (i.e., time out) implemented by the classroom teacher to decrease student C's misbehavior towards a classmate resulted in that student's missing much of the intervention; therefore no data on the behaviors was available during the time outs. This student also missed two sessions through the course of the public school semester, while the other two students missed only one. During follow-up, student C demonstrated an increase for all targeted behaviors, with behavior /B/ showing a sharp upward trend.

Student T demonstrated an upward trend for all behaviors both in the classroom environment and during the music therapy session. However, this student did not attend class during the follow-up phase, so no data could be taken.

This study was designed to investigate the effectiveness of singing sounds on the development of bilabial speech patterns in children with speech impairments. The development of speech and language can be a long, difficult process especially for children who possess speech impairments and/or other disabilities. Music can be a motivating factor for these children in developing speech and may reinforce other needed skills as well.

Until the semester this research took place, student J required a seatbelt chair to sit with his peers in "circle time" with the teacher. During the semester of this study, this student sat in his designated spot with few verbal reinforcements. He

participated in all music therapy sessions he attended, and maintained attention throughout most of the sessions. On two to three occasions, he required verbal reinforcement to pay attention during the intervention songs, as he was intrigued by his socks and shoes. Other than this, student J was generally cooperative and participated in all music therapy activities during the sessions.

Student C was also generally cooperative. However, there were times when she demonstrated misbehavior by hitting a peer or sticking out her tongue. These behaviors warranted placing the student in the “time out” chair where she sat by the teacher’s desk and could not participate in activities with the other children. (This time out intervention was designated in her IEP behavioral interventions.) She could talk while in this chair, and would mostly make sounds of disgust and frustration. She was placed in this chair once during a music therapy session and continued to sing between sounds of frustration, but did not perform any of the target behaviors.

Student T participated throughout every music therapy session without any verbal reinforcement. She was very cooperative and participated in every activity during the music therapy sessions. She also sang and made other sounds, but most were unintelligible. Towards the end of the research study, her speech was more discernible and she spoke more words that could be understood.

Due to the length of the public school semester, the time frame for this research was restricted. However, the data document a positive change in participants' target behaviors. Two students demonstrated an overall increase in

these behaviors, and all three students performed the behaviors during the follow-up phase of the study.

This study was only a small investigation of the effects of music therapy in a public school setting. The researcher emphasizes the need for more research including case studies, experimental studies with appropriate control groups, and qualitative studies. It is especially difficult to perform research in a public school setting because of the many regulations involved when working with children. However, this is a prime place of study for the effects of music on the development of speech in children.

Many questions remain concerning the use of music in speech/language development. These include: (a) whether speech behaviors should be investigated in isolation or in combination with others; (b) whether or not certain types of songs are more effective with certain populations; (c) whether children with different disabilities and in different ages groups present varied learning patterns for speech; (d) and whether some children with speech impairments may also possess other developmental disabilities and /or physical impairments that would have some significant effect on their abilities to learn language. Further research should also focus on whether other types of music activities, such as movement to music, use of visual aids while singing, instrumental activities, listening activities, songs which can also focus on various cognitive abilities, and songs that combine speech sounds or words with the appropriate sign language could produce better learning.

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APPENDIX A  
INTERVENTION SONGS

## Farmer Brown's Cow

36

Key of F Major

Belgian Folk Song

Musical notation for the first two lines of the song. The first line has a treble clef, a key signature of one flat (F major), and a 2/4 time signature. The melody is written on a single staff with notes and rests. Chords F, F, C7, and F are indicated above the staff. The lyrics are: "1. Old Farm-er Brown he had a cow, had a cow had a cow. But she got sick. I don't know how. All she said was 'Moo-oo'"

## I LIKE TO SING ABOUT ANIMALS

J. Jones

Musical notation for the first three lines of the song. The first line has a treble clef and a key signature of one flat. The melody is written on a single staff with notes and rests. Chords C, F, C, F, C, G7, and C are indicated above the staff. The lyrics are: "I like to sing a-bout an-i-mals. I hope you do too. I like to sing a-bout an-i-mals let's sing a-bout a few. The horse says ne-igh the cat me-ow"

## MY FAVORITE SOUND

J. Jones

Musical notation for the first two lines of the song. The first line has a treble clef and a key signature of two sharps (D major). The melody is written on a single staff with notes and rests. Chords D, A7, A7, and D are indicated above the staff. The lyrics are: "Lis-ten to me make my fa-vorite sound pret-ti-er sound can not be found"

## LET'S SING A SONG

J. Jones

Musical notation for the first line of the song. The first line has a treble clef and a key signature of one flat. The melody is written on a single staff with notes and rests. Chords D7, G7, C, F, and C are indicated above the staff. The lyrics are: "Let's sing a song a-bout things to eat, and then we'll name a few FOODS"

**APPENDIX B**

**CONSENT FORM FOR GUARDIAN OF PARTICIPANTS**

Texas Woman's University  
 Subject Consent to Participate in Research  
 Effects of Singing on Speech Patterns of Children with Expressive Language Delays

Researcher: Sherri Ross Phone: \_\_\_\_\_

Advisor: Dr. Nancy Hadsell Phone: \_\_\_\_\_

**Description of the Study:**

This study is research towards a music therapy master's degree. The purpose of research is to see if singing speech sounds has any effect on the development of expressive language skills in children with language delays. The time commitment will include intervention activities 1 time each week from January to May. Intervention will take place within a 30 minute music therapy session in my child's classroom. The researcher will observe my child in class before and after the music therapy sessions. The researcher is also the music therapist that works with my child and his/her peers in the classroom once a week.

The researcher will use a videotape to record data from the sessions, but only the researcher and speech therapist who works with my child will see the tapes. The tapes will be locked in a filing cabinet in the researcher's home while not in use. After the study is completed and a report written at the end of June, the tapes will be unwound and cut into pieces to be destroyed. My child's name will not be written in any report or used anywhere except the music therapy sessions and consultation between the researcher and the speech therapist. To prevent boredom, a variety of activities will be used including singing, playing instruments, movement to music, and listening. Intervention will take place within the music therapy sessions my child already participates in as part of his/her classroom curriculum.

**Benefits:** Benefits to my child may include increased oral language development, increased self-esteem from special attention, escape from my child's normal routine, and access to an intervention to help develop language skills. A report of this study will be given to me, and if required, to the school where my child is enrolled.

The researcher will try to prevent any problem that could happen because of this research. I should let the researcher know at once if there is a problem and she will help me. I understand, however, that TWU does not provide medical services or financial assistance for injuries that might happen because I am taking part in this research. Participation is voluntary and I understand that my child's refusal to participate will not include any penalty or loss of benefits to which my child is otherwise entitled. Also, I understand that I may withdraw my child from this research at any time. If I have questions about the study or my child's rights as a subject, I should ask the researcher whose phone number is at the top of this form. If I have questions later, or wish to report a problem, I may call the researcher or the Office of Research and Grants Administration at 817-898-3377. An offer has been made to answer all my questions and concerns, and I have been given a copy of this dated and signed consent form to keep for myself.

\_\_\_\_\_  
 Parent or Guardian signature

\_\_\_\_\_  
 Date

**APPENDIX C**

**CONSENT FORM FOR CLASSROOM TEACHER  
AND SCHOOL PRINCIPAL**

**Texas Woman's University**  
**Subject Consent to Participate in Research**  
**Effects of Singing on Speech Patterns of Children with Expressive Language Delays**

**Researcher:** Sherri Ross      **Phone:** \_\_\_\_\_

**Advisor:** Dr. Nancy Hadsell      **Phone:** \_\_\_\_\_

**Description of the Study:**

This study is thesis research for a music therapy master's degree. The purpose of research is to see if singing speech sounds has any effect on the development of expressive language skills of children with language delays. The time commitment will include treatment sessions 1 time each week, from January to May. Treatment will take place within a 30 minute session in my classroom. The researcher will observe the subjects in class before and after the treatment sessions. Two of my students will be subjects in this study, and my consent is needed because the researcher will be videotaping in my classroom.

The researcher will use a videotape to record data from the sessions and observations. Only the researcher and speech therapist will see the tapes. The tapes will be locked in a filing cabinet in the researcher's home while not in use. After a report is written, (end of June) the tapes will be unwound and cut into pieces to be destroyed. My students' names will not be written in any report or used anywhere outside of the music therapy sessions. To prevent boredom, a variety of musical activities will be used. The music activities will include singing, playing instruments, movement to music, and listening. The treatment stage of the study will take place within the music therapy sessions my students already receives as part of their classroom curriculum.

**Benefits:** Benefits to my students may include free music therapy services for the time spent towards this research which will focus on language development. Other benefits may include increased self-esteem from special attention, escape from normal routine, and access to an intervention to help develop and increase language skills.

The researcher will try to prevent any problem that could happen because of this research. I should let the researcher know at once if there is a problem and she will help me. I understand, however, that TWU does not provide medical services or financial assistance for injuries that might happen because I am taking part in this research. Participation is voluntary and I understand that my refusal to participate will not include any penalty or loss of benefits to which my students or I are otherwise entitled. Also, I understand that I may withdraw at any time. If I have any questions about the study or my students' rights, I should ask the researcher whose phone number is at the top of this form. If I have questions later, or wish to report a problem, I may call the researcher or the Office of Research and Grants Administration at 817-898-3377. An offer has been made to answer all my questions and concerns, and I have been given a copy of this dated and signed consent form to keep for myself.

\_\_\_\_\_  
 Teacher and/or Principal signature

\_\_\_\_\_  
 Date

**APPENDIX D**

**CONSENT FORM FOR GUARDIANS OF OTHER  
CHILDREN IN THE CLASSROOM**

**Texas Woman's University**  
**Subject Consent to Participate in Research**  
**Effects of Singing on Speech Patterns of Children with Expressive Language Delays**

**Researcher:** Sherri Ross                      **Phone:** \_\_\_\_\_

**Advisor:** Dr. Nancy Hadsell                      **Phone:** \_\_\_\_\_

**Description of the Study:**

This study is research towards a music therapy master's degree. The purpose of research is to see if singing speech sounds has any effect on the development of expressive language skills in children with language delays. The time commitment will include intervention activities 1 time each week from January to May. Intervention will take place within a 30 minute music therapy session in my child's classroom. The researcher will observe the subjects in class before and after the music therapy sessions. The researcher is also the music therapist that works with my child and his/her peers in the classroom once a week. My child **WILL NOT** be a subject in this research, but my consent is needed as there will be videotaping in the classroom.

The researcher will use a videotape to record data from the sessions, but only the researcher and speech therapist who works with my child will see the tapes. The tapes will be locked in a filing cabinet in the researcher's home while not in use. After the study is completed and a report written at the end of June, the tapes will be unwound and cut into pieces to be destroyed. My child's name will not be written in any report or used anywhere except the music therapy sessions. To prevent boredom, a variety of activities will be used including singing, playing instruments, movement to music, and listening. Intervention will take place within the music therapy sessions my child already participates in as part of his/her classroom curriculum.

**Benefits:** Benefits to my child may include increased oral language development, increased self-esteem from special attention, escape from my child's normal routine, and access to an intervention to help develop language skills.

The researcher will try to prevent any problem that could happen because of this research. I should let the researcher know at once if there is a problem and she will help me. I understand, however, that TWU does not provide medical services or financial assistance for injuries that might happen because I am taking part in this research. Participation is voluntary and I understand that my child's refusal to participate will not include any penalty or loss of benefits to which my child is otherwise entitled. Also, I understand that I may withdraw my child from this research at any time. If I have questions about the study or my child's rights as a subject, I should ask the researcher whose phone number is at the top of this form. If I have questions later, or wish to report a problem, I may call the researcher or the Office of Research and Grants Administration at 817-898-3377. An offer has been made to answer all my questions and concerns, and I have been given a copy of this dated and signed consent form to keep for myself.

\_\_\_\_\_  
 Parent or Guardian signature

\_\_\_\_\_  
 Date