IMPLEMENTATION OF MUSIC ACTIVITIES TO INCREASE LANGUAGE SKILLS IN THE AT-RISK EARLY CHILDHOOD POPULATION

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Abstract

The purpose of this study was to examine the short-term effects of a music education intervention on the receptive language skills of students in an at-risk early childhood program. The target population was nine students ages 3, 4, and 5 in an at-risk, inclusive classroom in a Chicago public school. The problem of language delay is indicated in the targeted students' preliminary evaluative data of receptive language skills as measured using the Peabody Picture Vocabulary Test (PPVT-III) and Teacher Rating of Oral Language and Literacy (TROLL) assessments. As a result of teaching music skills as recommended in ISBE and MENC learning standards, during the period from October 2006 to December 2006, the targeted early childhood students improved their receptive language skills. Results indicate that after 2 months of intervention the average student age equivalent increased 21.18% in receptive language and 34.67% in phonemic awareness. Unexpected outcomes included transfer of knowledge to the classroom and home environments, increases in musical identity and self-esteem, and continued practice of music activities in the classroom following the intervention. Educators may implement such music activities to increase receptive language skills in an at-risk preschool population.

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CHAPTER ONE

PROBLEM INTRODUCTION

Introduction and Rationale

The early childhood years, ranging from birth to age eight, are formative years that provide a foundation for further learning. Instructors can provide a structured and friendly environment to facilitate students' discoveries in the classroom. Providing opportunities to make associations between various skill areas helps a child to construct meaning. Of the various activities that lead to the development of language skills, music is one of the most intrinsic, expressive, and direct.

Language reception and production are dependent on hearing ability and fine-tuned through listening skills. In a study of the role of listening in learning music, Campbell (2005) stated that active listening encourages a fuller awareness of the *musical soundscape,* a world of sounds in which children live, thereby improving understanding of musical elements such as rhythm and pitch. Goldfield and Snow (2004) added that listening to and singing nursery rhymes and songs provides an opportunity to learn the language elements of prosodic and segmental accuracy, and that the repeated naming of objects throughout a story or song increases the uses of nouns in speech.

The area of language functioning called phonology is the study of sound patterns and sequencing the proper sounds of the words in the appropriate order. The ability to hear discrete speech sounds in individual words and to segment words into individual sounds, or *phonemic awareness,* is a required skill for learning to read. In fact, "the degree to which emergent readers are aware of the individual sounds in spoken words…has been shown to be a better predictor of reading success than intelligence,

parents' educational background, visual or auditory perception, memory or even eyesight" (Blachman, 1991; Wagner et al., 1994, as cited in Cecil, 2003, p. 57).

The following study will focus on how music in the early childhood curriculum increases language skills, particularly in the area of phonemic awareness. Cited research focuses on links between music and language, and the importance of understanding the sounds of a language before more sophisticated language skills can occur. Because young children, like all hearing people, live in a world of sound, an early childhood instructor can provide activities within the classroom environment that invite children to participate in the joy of music, while building their phonemic awareness.

My interest in this topic is rooted in my identity as a musician. One of my earliest musical memories is hearing the song, *Doe, a Deer* from *The Sound of Music* soundtrack, and playing it on the piano. My parents, soon after, enrolled me in a preschool group music class where I participated in playing the piano, singing, and studying rhythm. Because my family is very musical, my home experiences were filled with songs sung or played on the piano and guitar. The melody and rhythm of these tunes are a permanent fixture in my sense of identity, and have given me not only musical, but linguistic, analytical, historical, and social understanding.

Although I was fortunate enough to have parents who nurtured my gift in music, several of my friends speak of the missed opportunity to develop musical understanding in their earliest years. I believe that music is a gift in which all people can participate, and that providing early childhood students with opportunities for guided participation, peer collaboration, and creativity not only fosters language development, but invites each child to value with confidence of the musicality of his or her life.

Local Context

Student Population

The student population in the proposed study features a target group of 10 early childhood students who attend an at-risk preschool program at a public school located on the southwest side of a major Midwest metropolitan area. The school is a NAEYC accredited organization affiliated with a local university that serves three to five-year-old children identified as at-risk for academic failure and children with diagnosed special needs and their families. The center seeks to provide a collaborative environment between students, parents, teachers, and the community.

About one-third of the students with special needs present on the autistic spectrum, and the others have some type of developmental delay due to one or more causes. In a student racial and ethnic report dated December 2005, the school reported an enrollment of 197 students; 73.6% of whom are Caucasian, 19.8% African American, 1.0% Asian or Pacific Islander, 2.5% Hispanic, and 3.0% multiracial. A 2003 school report states that 18.9% of students are from families who have a low income, based on an enrollment of 187 students.

Faculty and Staff

The faculty includes seven teachers and 21 teacher assistants. The auxiliary staff consists of a case manager, parent coordinator; speech, occupational, and physical therapists; a school nurse, and a lunchroom manager. A racial and ethnic report of faculty and staff demographic information for the 2005 fiscal year indicates 60% Caucasian, 26.6% African American, and 13.3% Asian or Pacific Islander descent. A November, 2005 report of school administrators shows that the administration is comprised of two non-minority and no minority persons.

Facility

The facility is a one-story brick building that houses five preschool classrooms, one special needs preschool classroom, and one birth-to-three classroom. Climbing equipment and a grassy play area provide space for outdoor play. The neighborhood is a middle-income residential area, and the school is located next to a railroad crossing, but is entirely bordered by an iron fence to provide safety.

Program

Named for a local community volunteer, the school has been serving the needs of community children since it opened in 1999. The state pre-k program promotes close partnerships between teachers and parents in a variety of ways. Teachers write of concerns and achievements in daily notebooks to communicate a child's progress with parents. The school week runs from Monday to Thursday, and Fridays are reserved for professional development, home visits, and parent conferences. Opportunities for parent involvement include workshops, volunteering, and direct program input.

The staff strives to celebrate differences and to serve as a model program of blending special needs with regular classroom children. Promoting an optimistic view of the possibilities for early intervention and practices that lead to kindergarten readiness, the school uses the most recent research in the field to create the best outcomes for each child. Through partnering with the local university's schools of education, nursing and communication disorders, the preschool offers speech, occupational, and physical therapy to students who present needs in these areas.

Problem Statement

Early childhood students who are at-risk for academic failure or have special needs may be susceptible to language delay. Evidence for this problem exists in

language assessments such as the Peabody Picture Vocabulary Test and teacher observations of gaps in areas of phonemic awareness. The target group for this proposal is a group of nine, three- to four-year-old students who are at-risk for academic failure.

CHAPTER TWO

REVIEW OF LITERATURE

Introduction

A review of the literature was acquired from electronic database search of EBSCO and Academic Search Premier. In addition, book and journal sources were obtained from colleagues and library systems including public libraries, Saint Xavier University, and Governors State University. The search focused on the topic of music strategies to improve language skills in early childhood students, about which a limited amount of research was found. In particular, the search focused on studies that support the hypothesis that music activities in the early childhood classroom can increase language skills in the special needs and at-risk population.

Definition of Terms

At-risk – 1. Increased probability for school failure or learning problems because of factors associated with socioeconomic status, other family variables, physical or neurological abnormalities, potential suicide, or substance abuse. 2. In infancy and early childhood years the increased probability for developing physical or mental handicaps due to factors such as low birth weight, complications at birth or before, exposure to disease, and age or nutritional status of the mother (Schafritz, 1988).

Emergent literacy – The behaviors seen in young children when they use books and writing materials to imitate reading and writing activities, even though the children cannot actually read and write in the conventional sense (Ramsburg, 1998, as cited in NCREL, 1999).

Phonemic awareness - The ability to notice, think about, and work with the individual sounds in spoken words (Lokerson, J., et al., 2006).

Phonological awareness - A range of understandings related to the sounds of words and word parts, including identifying and manipulating larger parts of spoken language such as words, syllables, and onset and rime. It also includes phonemic awareness as well as other aspects of spoken language such as rhyming and syllabication (Lokerson, J., et al., 2006).

Kodaly method – Named for Zoltan Kodaly (1882-1967) of Hungary; a sequential system of singing which leads into the understanding of musical notation; teaching children to read and write music through singing (Wheeler & Raebeck, 1972).

Solfege – The vocal singing of pitches using the French nomenclature of *do, re, mi, fa, sol, la, si (ti), do* (Huang, 2006).

Transfer of learning – Learning in one context enhances (positive transfer) or undermines (negative transfer) a related performance in another context. Transfer includes near transfer (to closely related contexts and performances) and far transfer (to rather different contexts and performances). Transfer is crucial to education, which generally aspires to impact on contexts quite different from the context of learning (Perkins, D.N., 1992).

Early Childhood Language Arts

The four areas of language arts in order of development are listening, speaking, reading, and writing (Cecil, 2003). Clay defined in 1966 the stage of learning prior to formal instruction in these areas as *emergent literacy* (*NCREL*, 2006). In an article on phonemic awareness, Woods describes the value of early language experiences in building a foundation for later language skills (2003). A variety of classroom activities taught across the curriculum that emphasize the particular components of literacy offers children the opportunity to explore and experiment with language.

Listening

As one of the four essential components of language arts, listening is crucial to language development. For students who are hearing impaired, language processing becomes difficult because oral language, or the speaking of words, is dependent on hearing those words first. Therefore receptive language precedes expressive language, making hearing and listening skills essential for spoken language (Ratner, 2004).

Phonemic Awareness

The most important predictive skill that preschoolers can develop to further their future reading ability is phonemic awareness (Cecil, 2003). Adams describes five levels of phonemic awareness from simple to complex as knowledge of nursery rhymes, oddity tasks that require comparison of sounds, syllable blending and segmentation, phonemic segmentation, and phoneme manipulation (1990). In the 1990 book, *Beginning to Read,* Adams summarized leading reading research which noted not only a predictive, but causal relationship between phoneme awareness and reading success. The most relevant research in the book to the present study is the chapter on the knowledge of nursery rhymes in children who have not yet learned to read.

In a 1987 study, MacLean, Bryant and Bradley hypothesized that nursery rhymes may serve as an origin of the basic components of phonological awareness. A group of 66 children age 3-3 were asked to recite five favorite nursery rhymes, and were assessed every four months until the age of 4-5 on Adams' five levels of phonemic awareness. When all demographic variances were removed, the results showed that, "Early knowledge of nursery rhymes was strongly and specifically related to development of more abstract phonological skills and emergent reading abilities," (Adams, 1990, p. 80).

Using this research in practice, early childhood teachers seek to incorporate direct instruction of phonemes and the meaning-centered whole language approach to emergent literacy in daily classroom activities, including singing nursery rhymes.

Standards

The Illinois early learning standards for language arts begin with understanding three main concepts; that meaning is carried in pictures and symbols, letter recognition, and letter-sound matching. It goes on to require the development of phonological awareness through rhyming, and the ability to separate and repeat sounds in the spoken language (*ISBE*, 2002). These early standards emphasize the ability to hear and manipulate the sound of language as an essential skill in emergent literacy.

The National Association for Music Education (MENC) endorses standards for pre-kindergarten children that focus on singing and playing music. Children are encouraged to use their voices expressively and sing a variety of songs alone and in a group. One goal is that through singing, a child's development in rhythm and pitch will become increasingly accurate. Another is that students will experiment with a variety of instruments and other sound sources, and be encouraged to play simple melodies and accompaniments on instruments. These goals allow children to become emergent musicians in the process of learning a structured language of sound (MENC, 2002).

Findings

Problems

Language development is a lifelong process that begins in utero and continues to develop. Although language theorists do not yet understand exactly how humans acquire language, many theories offer a glimpse at the human-specific ability to use language. While language is an innate skill, not all children develop it easily or well

(Ratner, 2004). In some early childhood students, language development is delayed. For students who for any reason do not receive adequate exposure to language rich activities, the opportunity to experiment with the elements of language is lost.

Causes

The National Institute on Deafness and other Communication Disorders (NIDCD) has estimated that in the United States the prevalence of speech sound disorder in young children is 8 to 9% (2006). A speech sound disorder is just one type of atypical language development. Causes of atypical language development can be put into four categories: hearing impairment, mental retardation, autistic spectrum disorder and specific language impairment. Depending on the cause, hearing disorders may be related to other aspects of total health. In fact, about 30% of children with a significant hearing loss have other disabilities that may impact their language and speech acquisition; the skills necessary for reading (Ratner, 2004).

Since the No Child Left Behind Act was endorsed in 2002, reading achievement has increased in all grade levels except for adolescents (*U.S. Department of Education*, 2003). Yet, the Federal Interagency Forum on Child and Family Statistics reports that in 2005, 35.8% of fourth grade students performed below the basic level of reading and mathematics achievement. In order to prepare successful students, including those with language delay or atypical development, efforts must be made to increase emergent literacy skills before formal schooling begins.

Another cause of a child's difficulty in acquiring language is being at-risk for academic failure. At-risk factors include divorce, foster status, low socioeconomic status, single parenthood, very low birth weight, premature birth, or an at-risk health condition at birth. Due to social-emotional and physical health challenges, these

children may have an increased likelihood of language disorders and later literacy difficulties (Larney, 2002).

In 2005, the Federal Interagency Forum on Child and Family Statistics found that of children ages zero to five, 84% were in very good or excellent physical health, leaving 16% not in good health. In 2004, 8.1% of infants were born with low birth weight compared to 6.8% in 1980, which is an increase of 19% over 24 years. This statistic is the highest increase of all health factors reported for 2005. In addition, in 2005, 57.2% of children age three to five were enrolled in early childhood services (2006). This creates a situation in which early childhood teachers are more likely to work with children who may have a language disorder or delay.

Solutions

In order for children who are at-risk for academic failure or have special needs to gain emergent literacy skills that will increase later reading achievement, early childhood teachers must continue to provide rich language experiences through which children may explore the elements of language. The developmental appropriateness of teaching language skills to young children was described as long ago as the turn of the century. At that time Montessori emphasized the value of early language experiences in building a foundation for reading during the sensitive period for language, which occurs prior to formal instruction, during the early childhood years (Woods, 2003).

Several solutions to the problem of language disorder and developmental delay in early childhood have been proposed, starting with the need for accurate diagnosis. Upon entering a preschool program, children are screened to determine the nature and extent of a language delay using assessments such as the McCarthy Scales of Children's Abilities (ETS, 2006). For example, in the 2004-2005 school year at the

participating school, a four-year-old student with a delay in speech skills due to a seizure disorder was assessed to understand the nature of the delay and the most helpful interventions. Following assessment, the child was referred to work with a speech language therapist who used best practice strategies to build understanding in the student's areas of weakness (Bennett, 2005).

In addition to assessment, it is imperative to teach within the guidelines of developmentally appropriate practices (DAP). Such professionally recognized practices ensure that teachers respect a child's reality and abilities in the process of instruction. Key components of DAP include the fact that young children's brain structures are not yet compartmentalized. Therefore, integrating content areas and sensory experiences across the curriculum is a most appropriate strategy in the effort to provide children with opportunities to explore and experiment, and to make connections between the various concepts, tangible items, and people in the classroom (Bredekamp & Copple, 1997).

Phonemic Awareness

Of all of the component skills of the language arts, the most important is phonemic awareness, or the ability to hear, manipulate, and identify individual sounds in spoken words. It has been found that the degree to which emergent readers are aware of individual sounds in spoken words is a better predictor of reading success than intelligence, parents' educational background, visual, or auditory perception, memory, or even eyesight (Cecil, 2003). Teaching phonemic awareness in the early childhood classroom can be achieved in a variety of developmentally appropriate ways.

Word games

In a 2003 case study, Woods described working with a child who was verbally expressive but who had a developmentally normal articulation disorder. When

assessed for phonemic awareness skills, the child could perform all areas of phonemic awareness, but could not omit sounds of words. For example, when the teacher asked the student to, “say *cat*, but do not say the /c/,” the child could not perform the task.

Teachers began using word games and a magnetic alphabet so the child could manipulate the letters and visually segment parts of a word into discrete sounds. Within three months the student was able to omit sounds and naturally progressed in using the alphabet, blending sounds, and beginning to read. Without screening, the child’s weakness would not have been addressed and strengthened. In addition to screening and subsequent implementation of winning instructional strategies to develop phonemic awareness skills, music offers another approach to correcting the problem.

Music

The use of music in the classroom can be helpful in providing an alternative mode of communication when language skills are not yet developed. Indeed, nonverbal communication may be more helpful or appropriate when children have speech and communication difficulties (Sutton, 1995, as cited in Lefevre, 2004). In a discussion of musical meaning, Campbell (2005) described music as part of a person’s life from the moment that sounds can be heard in utero. Music development continues in the form of vocalizing and babbling, singing songs, and experimenting with pitch and rhythm; making music instruction suitable for teaching young children (Campbell, 2005). Several methods of music education have been used successfully with early childhood students.

Kodaly method

The basic goal of the Kodaly method is to teach children to read and write music through singing using rhythmic counting and hand signals to help develop inner hearing

and feeling (Wheeler & Raebeck, 1972). In a 2003 study, Olson implemented the Kodaly method of music instruction to affirm the parallel concepts of music, language and math in first, second, and third grade Montessori students. Students received two, 25-minute sessions per week in Kodaly music instruction, which focuses on a sequential progression of new musical concepts. This sequential emphasis is of interest in the early childhood classroom, as development progresses from basic to more complex in an endless dynamic of building on previously learned concepts. Emergent literacy skills, including the previously discussed area of phonemic awareness, are also learned in a sequential manner, which the Kodaly Method shares in its inherent structure.

Results from Olson's study showed that when paired with Kodaly music instruction, second grade female students significantly improved their math skills, and first grade male students significantly improved their reading skills (2003). The notion that boys more easily acquire math skills while girls acquire language skills is stereotypical and controversial; yet a recent report of the Early Childhood Longitudinal Study has affirmed this division at certain ages (Jacobson, 2002). Perhaps the results of Olson's study support a theory that music can act as a neutralizer of the stereotypical gender gaps between boys and girls in acquiring reading and math skills.

The Kodaly method from Olson's study describes similar elements used in the present research study. These elements include singing songs that focus on rhythmic counting and hand signals. The Kodaly method and the activities in the present study combine visual, kinesthetic, and verbal skills, and listening and counting tasks to offer several entry points from which learners can develop music skills.

Rainbow Solfege

The Rainbow Solfege system is a method of displaying traditional elements of Solfege in color to provide children with a visual means of communication. In addition, hand movements provide kinesthetic opportunities. In 2001, Colla stated that the ideal window to learn to sing a tune is from birth to age nine and that learning colors occurs within the same age span. Color-coded manipulatives and colorful charts combined with sound and kinesthetic activities results in *synesthesia,* the simultaneous triggering of several senses by the same stimulus.

This developmentally appropriate music instructional method integrates several of the eight multiple intelligences, as described by Gardner, resulting in a rich sensory experience. The musical component of rhythm parallels syllables in language structure, so that the student may make an association between the two languages of music and emergent literacy (Colla, 2001).

Reading in Motion

Reading in Motion is an interactive literacy program that combines music, movement, and drama to communicate the written, spoken, and reading elements of literacy to young children. Each sound, and then syllable, is tapped on the hands to establish a link between the sound of the language and the rhythm that it makes. A 2005 Reading in Motion technical report (Rose & Harvey, 2005) states that, “in 2005, only 42% of Chicago Public School third graders were reading at grade level. In contrast, 75% of Chicago Public School kindergarteners in Reading in Motion’s program were reading at grade level at the end of the school year” (Rose & Harvey, 2005).

Nursery Rhymes

The hand movements used in Reading in Motion's program can be incorporated during singing to integrate kinesthetic and musical abilities. Not only does singing nursery rhymes foster music development, it promotes phonemic awareness when the instructors call attention to rhyming patterns (Cecil, 2003). Teachers can encourage singing and the use of instruments to build the connection between rhythm and sound.

In addition to MacLean, et al.'s previously discussed research on nursery rhymes and phonemic awareness, Harrington and Berke noted in 2005 the kinesthetic dimension of singing and acting out nursery rhymes. In particular, singing nursery rhymes using finger play motions and reading books with rhythm, rhyme and repetition can help emergent readers relate to the physical dimension of the activity. When children are wholly involved in the music, they are engaged in listening, singing, playing instruments, and moving (2005). Children enjoy this type of multiple sensory integration activity while building early experiences that lead to future learning.

Proposed Solution

In the 2002 study of relations among musical skills, phonological processing, and early reading ability in preschool children, Anvari found that music skills correlated significantly with phonological awareness and reading skills in a population of 200 four and five-year-old children. Noting the commonality between music and language in that both are auditory and vocal processes, the study sought to examine the relationship between musical processing and phonemic awareness, and how these factors relate to reading development (2002).

Alternating music and language tasks, children were given a battery of tests over the course of five sessions, each lasting 20 to 30 minutes each. The number of tasks

varied with each session depending on the attention span of the child. A total of 13 possible tasks were presented sequentially, including: rhyme generation, rhythm production, blending, and rhythm discrimination. This set was followed by chord discrimination, the Rosner Test of Auditory Analytic Skills, chord analysis and the Wide Range Achievement Test-3. Finally, participants were presented with a reading subtest, melody discrimination, and auditory memory tasks, followed by, mathematics, and Dunn and Dunn's 1997 Peabody Picture Vocabulary Test (PPVT) (Anvari, et al., 2002).

Following factor analysis and four regression analyses, results showed that music perception skill is related to phonological awareness and early reading development. Reasons for the relationship included shared auditory mechanisms, including phonemic awareness skills. Even after variances shared with phonemic awareness were removed, however, music skill still predicted reading showing that phonemic awareness and music perception use the same auditory and cognitive skills needed for reading, while using unique processing skills (Anvari, et al., 2002).

Discussion of findings and conclusions

In summary, recent research on the connection between music and language development continues in light of findings in the areas of brain and child development. The association between music and language has been documented, yet the exact musical elements that improve language skills have not yet been isolated (Anvari, et al., 2002). Several methods of music instruction, such as Kodaly, Rainbow Solfege, and Reading in Motion, have been effective in promoting language skills in young children. Music in the classroom provides a nonverbal and symbolic language that is developmentally appropriate and intrinsically motivating. From these methods a child may construct knowledge to enhance emergent literacy skills (Lefevre, 2003).

CHAPTER THREE

ACTION PLAN

Project Objective

The following study offers a solution to the problem of language delay in the at-risk target population by replicating the Anvari study using similar methods. Focusing on rhyme and rhythm, two of the earlier developed areas of phonemic awareness, students participated in musical activities twice weekly over the course of 10 weeks. The music activities were provided for the entire classroom while the target group received pretest and posttest evaluations of receptive vocabulary, language development ratings, and informal observation of progress in emergent literacy.

Target Group

Ten children between the ages of 3-6 and 4-10 (M = 4-2) were recruited from one classroom. Participants were selected based on parental consent, teacher recommendation, and the presence of at-risk or special needs status (Appendix B). One participant was eliminated from the study after two weeks when the family moved out of the district, resulting in a target population of nine students. Three participants are female, six are male; eight participants are Caucasian and one is African American.

All nine participants met the requirements for at-risk status under the Illinois State Pre-K Program. However, none of the participants qualified for classification into the special needs category. All of the 18 students in the classroom qualify for at-risk status, while five students have special needs, including presentation on the autistic spectrum, ADHD, and speech disorder.

Methods of Assessment

Data Collection Process

The Peabody Picture Vocabulary Test (PPVT)

The Peabody Picture Vocabulary Test (PPVT) was individually administered during the first week to determine a baseline of receptive language skills. The PPVT asks participants to examine four 3x4" pictures on each page, listen to the administrator's verbalization of the target word, and point to the picture that best represents the word. Before the test begins, the participant must respond correctly and without help to at least two consecutive training items. All of the participants were physically and cognitively able to correctly answer both training items.

The PPVT consists of 204 items that are grouped into 12-item sets. A total of eight sets are normed for age ranges from 2-6 to 3, to 17 to adult (Appendix C). Although the first set is normed for an age less than the participants' chronological ages, the pre-and posttests began at the first item in the 2-6 to 3-0 set to ensure the fairest opportunity for receptive expression and the most comprehensive collection of data.

Norming tables were used to calculate age equivalents. Table 1 and Figure 1 report the pretest chronological age, age equivalent, and difference between the two values.

Table 1

PPVT Pretest Scores: Chronological Age (CA) and Normed Age Equivalents (AE)

Student	*Chronological Age (year-month)*	*Age Equivalent (year-month)*	*Difference (months)*
1	3-6	2-9	– 9
2	4-3	4-6	3
3	4-3	6-0	21
4	4-4	6-0	20
5	4-4	2-4	–24
6	4-4	5-7	15
7	4-5	5-3	10
8	4-10	5-5	7
9	4-10	4-11	1
M	4-4	4-8	7

CA=Chronological Age; AE=Tested Age Equivalent; Difference= AE minus CA.

Figure 1

PPVT Pretest Scores: Chronological Age (CA) and Normed Age Equivalents (AE)

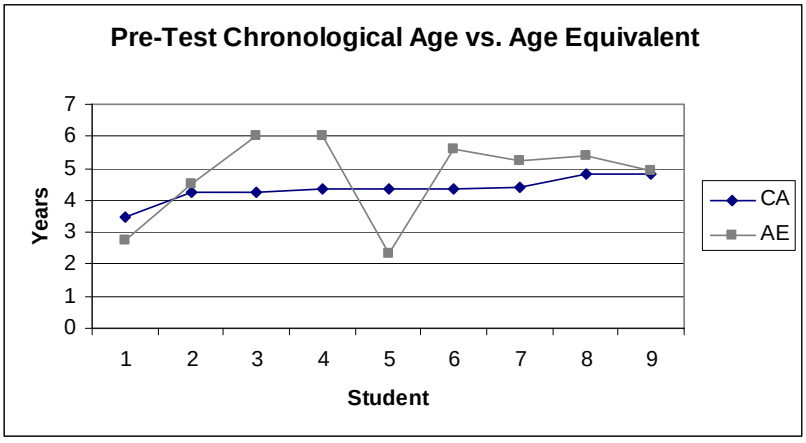


Table 1 and Figure 1 indicate a broad range of abilities among participants whose ages span only 1-4 (one year and four months). Student 1 was the youngest and the second most nonverbal student. Students 2 and 9 were talkative but at times had difficulty attending. Students 3, 4 and 6 had the highest pretest scores, and were usually attentive. The teachers from Student 6's previously-attended school claimed that the student had a learning difficulty and was not thriving in the classroom; yet the student's pretest score reveals excellent cognitive development. During the pretest, Student 5 avoided eye contact, remained nonverbal, and made uncomfortable facial expressions. Students 7 and 8 were attentive like students 3, 4, and 6, but tended to be quieter during opportunities for classroom discussion or during outdoor play.

Table 2 lists the PPVT pretest items that were answered incorrectly by 50% or more of the participants.

Table 2

PPVT Pretest: Eleven Most Frequent Items Answered Incorrectly

Pretest	Item #	Grammar	Weighted Error %
peeling	31	verb	66.67
writing	55	verb	66.67
surprised	88	adjective	56.00
interviewing	90	verb	56.00
nostril	74	noun; body part	55.71
towing	77	verb	55.71
heart	83	noun; body part	55.71
wrench	84	noun	55.71
knee	19	noun; body part	55.56
diving	52	verb	55.56
dripping	60	verb	55.00
M			57.66

The percent weighted error was found by accounting for the number of students participating on each item. The most challenging words were verbs, which accounted for six of the top 11 incorrect answers. The next most difficult grammatical form was the noun, especially body parts.

The Teacher Rating of Literacy and Language (TROLL)

The second quantitative method of data collection was the TROLL rating scale of literacy and language (Appendix C). The classroom teacher filled out the scale for each participant during the fifth week of research implementation. The data was collected in the fifth week rather than the first because by the fifth week, participants had been

attending school for five to nine weeks; long enough to acclimate to the school, classroom, and research implementation environments. Since participants were more comfortable, analysis of language skills was hypothesized to be more accurate and fair.

Table 3

TROLL Pretest: A Four-Point Scale, where 1=lowest and 4=highest

Student	Communicate Personal Experiences	Recognize and Produce Rhymes	Use a Varied Vocabulary or try out New Words
1	I	I	II
2	III	II	II
3	II	I	II
4	III	II	III
5	I	I	II
6	II	II	II
7	IIII	II	III
8	IIII	II	III
9	II	I	II
M	2.22	1.56	2.33

Table 3 demonstrates that the two highest levels of development among the participants were in the ability to communicate personal experiences and use new vocabulary words. Rhyme recognition and production was slightly less developed, and may be a skill that would benefit from direct instruction or application through enjoyable and familiar songs.

Journals and Commentary

The third method of data collection was the qualitative commentary gathered from teachers, parents and participants (Appendix E). During the third week of implementation, the song, *Five Green and Speckled Frogs*, was introduced using a colorful poster, which accomplished three main goals. First, the poster provided visual interest that, when combined with the researcher's use of the K-W-L method of inquiry teaching, encouraged students to verbalize their current understanding of frogs. Second, in sharing their knowledge, students engaged in speaking and conversational turn-taking. Finally, these social-emotional skills increased students' self-esteem while allowing them to practice receptive and expressive language skills in a group setting.

The song featured new vocabulary including the words, *speckled,* and *delicious* challenging the participants to learn more complex word structures. The poster featured removable Velcro frog pictures, which allowed the researcher to move the pictures while singing, giving visual support in the use of verbs (Appendix F).

Later that same day, the teacher assistant observed that Student 8 transferred vocabulary from the intervention to a classroom activity. The class had collected autumn leaves and when studying them indoors, the assistant asked the students if the leaf had spots, and Student 8 said that it was *speckled.*

The music activities were evaluated on four levels. First, the researcher assessed participants' prior knowledge about the musical and conceptual topics in each week's singing activity. Next, formative assessment through observation was used during each activity to determine the extent of each student's understanding, and whether any instructional modifications were necessary. The third method of evaluation occurred at the end of each activity, when the researcher asked the students clarifying

questions to guide them through a process of self-evaluation. Finally, ongoing assessment took place over the course of the 10-week project. Continuous reflection guided the planning of appropriate and challenging music activities along the sequence from basic to more complex.

In conclusion, the problem of language delay in the early childhood population can be addressed through several developmentally appropriate means of intervention. This study proposes the use of music activities to strengthen emergent literacy skills. As seen in Chapter 3, the target population demonstrated a wide range of receptive vocabulary skills based on the PPVT pretest results that range from AE 2-3 to 6-0. It was hypothesized that the sequence of music activities in the intervention would increase these scores, reflecting development in phonemic awareness and receptive vocabulary.

Project Objective

The problem of teaching emergent literacy skills to children in the target population was addressed using simplified solution strategies from the Anvari, et al. study (2002). As a result of introducing music concepts to a group of nine early childhood students over the course of 10 weeks, students would increase their receptive language skills, sharing of personal experiences, rhyme recognition and production, and use of a varied vocabulary. These skills would be demonstrable by final performances of the PPVT test, the TROLL rating scale and teacher commentary.

Action Plan

The action plan was approved by the Saint Xavier University Institutional Review Board, the school administrator, and the classroom teachers, prior to implementation.

The plan outlined a 10-week intervention that included twice weekly visits for 10 to 15 minutes each. Table 4 presents the action plan implemented in the study.

Table 4: Music Activities Action Plan

Week 1 **Day 1** 10/10/06	Introduction to students • Sing with students and accompany on guitar • Songs planned and sung: *Twinkle, Twinkle, Little Star,* and *If You're Happy and You Know It* • Student requested songs sung: *Alphabet Song,* and *Old MacDonald*
Week 1 **Day 2** 10/12/06	• Administer PPVT-III to 10 student participants • No music activity this day
Week 2 10/17/06 10/19/06	• Sing *Colors,* by Hap Palmer • Accompany singing with guitar • Engage in color recognition and kinesthetic activity
Week 3 10/24/06 10/26/06	• Sing *Five Green and Speckled Frogs*, by Raffi • Feature poster with movable Velcro pieces • No guitar accompaniment • Engage in counting, color, verbs, new vocabulary
Week 4 10/31/06 11/2/06	• Sing *Toe, Leg, Knee*, by Jim Gill, along to the CD • Engage in kinesthetic movement, naming body parts, and Solfege • Sing *Knuckle Song*, by Jim Gill, along to the CD • Engage in naming and locating body parts
Week 5 11/7/06 11/9/06	<u>11/7/06</u> – Play instruments along to Children's favorites CD • Engage in identifying and playing percussion instruments <u>11/9/06</u> – Sing *I Clap My Hands,* with no guitar or CD playing • Engage in kinesthetic movement and body parts identification
Week 6 11/14/06 11/16/06	• Sing *Echo Me*, by Kathy Poelker, along with CD recording • Engage in singing and hand movements to learn the new song. • Engage in American Sign Language (ASL) • Listen and respond to verses and clapping rhythms
Week 7 11/21/06 11/23/06	No Lesson – Field Trip and Thanksgiving Holiday Week of Data Analysis and Record Keeping
Week 8 11/28/06 11/30/06	• Sing *You'll Sing a Song and I'll Sing a Song*, by Ella Jenkins • Sing along to CD, no guitar used • Discuss and engage in kazoo playing • Engage in listening and responding, singing, and whistling

Week 9 Day 1 12/5/06	• Administer PPVT posttest to three participants • Review songs: *Colors,* and *I Clap My Hands.* • Guitar accompaniment • Engage in color and body part identification
Week 9 Day 2 12/7/06	• Administer PPVT posttest to two participants • Review songs: *Echo Me,* and *I Clap My Hands.* • *Echo Me:* Sing along to CD, use ASL, call and response • *I Clap My Hands*: Sing with researcher, kinesthetic movements
Week 10 Day 1 12/12/06	• Administer PPVT posttest to two participants • Review songs: *Five Green and Speckled Frogs,* and *You'll Sing a Song and I'll Sing a Song* • CD accompaniment and use of poster
Week 10 Day 2 12/14/06	• Administer PPVT posttest to two participants • Review songs: *Toe Leg Knee,* and *Echo Me* • CD accompaniment • Kinesthetic movement, ASL, body part identification, call and response

The intervention combined many of the solution strategies described in Chapter 2 to implement music activities to increase language skills. The developmentally appropriate practice of music has been supported by professional institutions including NAEYC, MENC, and the ISBE. Research also documents the developmental benefits of using music to teach language skills at an early age (Lefevre, 2004), while the sequential process of The Kodaly Method has been proven to increase language skills in elementary age children (Olson, 2003). With these solutions in mind, the music activities were planned to include in progression simple to more challenging musical and linguistic elements.

CHAPTER FOUR

RESULTS OF THE INTERVENTION

The objective of this study was to increase language skills in the targeted early childhood population. Music activities that featured the simplest stages of phonemic awareness; rhyme and rhythm, were implemented twice weekly for 10 weeks. The action plan outlined the sequence of music beginning with previously known songs and ending with songs that incorporated new vocabulary and American Sign Language. In this manner, the simple to complex sequence is shared with The Kodaly Method of music instruction. The research also was similar to the Anvari study of music intervention with preschoolers that yielded development in phonemic awareness.

Historical Description of the Intervention

During the first visit, classroom teachers facilitated a greeting between the researcher and the students. The researcher explained the reason and positive expectations for the intervention. Next, the researcher asked the students about music, singing, and the guitar. The students applied focused attention to the music and to the guitar itself. On this first meeting, the students sang four familiar songs; two of which were planned, and two that students requested. On the next visit, the researcher administered the PPVT pretest, and no music activities took place.

Week 2, or the first full week of music activity, featured the song, *Colors*, by Hap Palmer. The song asks students to listen carefully as the song leader calls out colors and asks students to stand up or sit down, depending on whether they are wearing the clothing of that color. The researcher played the guitar along with the CD recording for the song's introduction, then stopped the CD and continued to guide the verses while accompanying on guitar.

By playing the guitar, the researcher altered the tempo of the song, lengthening each phrase so that the students could process the instructions. The researcher asked the students to *listen to my words,* before the next verse was sung, to encourage listening and attending skills. Students heard the words, looked at their own clothing, verbalized their discovery, *I'm wearing red!* and listened again for the instruction to sit down or stand up, *red stand up.*

This activity focused on the first step in the language arts; listening (Cecil, 2003). The session established the researcher as the leader for subsequent music activities while giving an opportunity for students to engage their sense of hearing, movement, and verbalization. The song was repeated on the second visit of the same week.

Week 3 built on the previous week's focus on color, to feature verbs, new vocabulary, counting, and sequencing. The song, *Five Green and Speckled Frogs,* was sung without CD or guitar accompaniment so the researcher could use both hands to illustrate the story. The 2x3' poster featured a brown log with black spots, five green frogs with black spots and an extended red tongue near which two bugs flew. The frogs were arranged on top of the log, and the numbers one through five appeared above the frogs. The frogs and numbers were attached to the poster with Velcro so they could be moved. Finally, a blue pool was arranged below the log, and made of two pieces of blue poster board, stapled together to form a pocket.

Before the song began, the researcher guided the students in a K-W-L discussion of frogs, using open-ended questions to encourage the process of inquiry. The students were asked to notice and discuss the patterns, colors, actions, and numbers on the poster. After five minutes of discussion, the researcher began the guided singing experience. The song's lyrics count the number of frogs from five to

zero. Sensitive to the concept of directionality of print, the numbers were aligned from one to zero, from left to right. As the song counted backwards from five to one, the frogs were removed from right to left.

After singing the song twice, the researcher asked the class about counting backwards. Student 7 quickly counted backwards out loud, from ten to one, after which the researcher led the class in looking at the frogs and counting from five to zero.

In addition to counting, the song featured the use of verbs and new vocabulary. The movable frog characters animated the verbs in the song, providing a visual stimulus that enhanced the verbal and music components of the activity. As verbs were the most frequently missed grammatical form on the PPVT pretest (Table 3), it was advantageous to introduce verbs early in the intervention to provide a large time frame for development. Using colors, the nonverbal and intrinsically motivating language of music (Lefevre, 2002), and a concept that was understood through previous experiences, the activity could introduce a challenge such as verbs, with greater stability.

The second challenge in the song was the use of new vocabulary. The words, *speckled* and *delicious* feature the opportunity for syllable blending and segmentation, letter sound blending, and may be completely new to many participants, depending on previous language experiences. The success of the *Frogs* activity was documented in the Journal Commentary (Appendix E) which cited the positive and near transfer of learning from intervention to classroom activities later that day.

During Week 4, a music activity inspired by the Rainbow Solfege method was implemented that used not color, but kinesthetic and sensorial elements to augment the song's music and language skills. Jim Gill, a local children's musician with a Master's

degree in Child Development, has created several recordings of developmentally appropriate songs for preschool age children. The album used for this lesson is *Jim Gill Sings Do-Re-Mi on his Toe-Leg-Knee.* The researcher was delighted to find a specific song that would teach Solfege using body parts, for two reasons. First, the notion of Solfege is central to the research project. Next, the pretest data of the PPVT indicated that nouns accounted for 4 out of 11 most frequently missed items, and that body parts made up 3 of the four noun items, including the words, *nostril, heart,* and *knee.*

The song, *Toe Leg Knee* was selected for Week 4. The researcher created a poster of a person with each of the body parts from the song highlighted with color. The lesson began with a K-W-L discussion of the body, during which the researcher pointed to each part and asked the students to name the part. New vocabulary was introduced, including the word, *jaw,* which most students were unfamiliar. After identifying the body parts and discussing the activity, the researcher led the class in singing along with the CD.

Using body parts whose vowel sounds rhyme with those of standard Solfege, Gill creates a brilliant bridge from play to music education. The Solfege items, *do, re, mi, fa, sol, la, ti,* and *do*, become, in the song, *Toe Leg Knee; toe, leg, knee, arm, elbow, jaw, teeth nose.* The song leads the participants in naming and touching each body part in the major scale from toe to nose, and back down from nose to toe. A call and response structure encourages listening skills when the singer chooses notes, or body parts, in the scale, to create a new melody. The students enjoyed this activity; evidenced in their smiles and their complete attention to the researcher and the words. The classroom teachers expressed respect and admiration for the genius of the song, in applying kinesthetic movement to music notation.

The second song sung during Week 4 was another Jim Gill tune from the same recording, called *Knuckles Knees*. This song was chosen to reinforce the body parts through a different melody. However, the researcher found that the tempo was so fast that the words and actions of the song became second in importance to the rapid pace. The students soon became silly as the exercise became a game in which the researcher could not keep up. After attempting to sing this song twice during Week 4, the researcher noted for future activities that tempo must be considered so that the content of the activity is not compromised.

During Week 5, the researcher used percussion instruments that were already available materials from the classroom. The collection included several jingle bell bracelets, claves (wood sticks), guiros (gourd with ridges and a wooden stick), maracas, and wood tone blocks. The researcher spent almost 10 minutes on naming, describing, and handing out the instruments as well as proper use and safety. The students played the instruments to a CD of children's favorite nursery rhymes for about three minutes. It was decided not to use the instruments on Day 2 of Week 5 due to a degree of jealousy and excitement in the students' behavior, which proved distracting to the teaching.

An appropriate substitution was made on Day Two of Week 5, when the researcher lead the class in singing, *I Clap My Hands,* a simple song of four rhyming directions in each verse. The song reinforces listening skills and allows for standing and movement throughout, which helped students expend excess energy. The special education teacher remarked that the song was especially developmentally appropriate, and gave praises for the choice of song.

During Week 6, the researcher decided to build on the call and response pattern of the previous week's song, *I Clap My Hands,* and introduce American Sign Language

(ASL). The song, *Echo Me*, by Kathy Poelker, is entirely call and response, requiring students to listen closely in order to repeat each phrase. First, the researcher led the class in singing along to the CD. The class sang the song twice, when the researcher asked them if they were ready to try using their hands in the song. Each ASL sign was carefully demonstrated and discussed with the students, and then the class sang the song again using ASL.

The results after one attempt were impressive. Two students who were not in the target group, but who had struggled to fully engage in the songs up to this point in the intervention, suddenly were singing and using their hands. That is, ASL seemed to offer a means to engage students who were otherwise largely nonverbal and inexpressive during the previous five weeks.

During the second visit of Week 6, the majority of students remembered the signs and was able to sing along through all verses. In addition to featuring call and response and ASL, the song, *Echo Me*, has one whole verse in which a rhythmic pattern is clapped out, and the children must respond in creating the same pattern. This activity was an appropriate interlude as the third of five verses in the song; establishing the focus of the song as listening, hearing and repeating patterns.

Week 7 was the week of Thanksgiving holiday and a school field trip. No visits were made to the school, but the time was used for data collation and review.

Week 8 featured the song by Ella Jenkins, *You'll Sing a Song and I'll Sing a Song.* The class sings portions of this song regularly as their weather song, so they were somewhat familiar with the melody and lyrics. To offer another opportunity to play instruments, the researcher introduced plastic kazoos for each student. After a K-W-L discussion of kazoos, and instructions on proper use and safety, each student received

a kazoo. The researcher instructed the students to hum through the kazoo, and not to simply blow air through it, or it would not make a sound.

The most challenging aspect of this lesson was waiting for the fourth verse, which featured the kazoos. Students sang along with the researcher and the CD recording, leaving the kazoo in their laps and patiently waiting for the verse. The researcher verbally praised the class for their patience and listening skills throughout the song. At the end, the researcher exclaimed that the class had performed as an entire band; one that played their instruments together and followed the director. The researcher mentioned to the students that playing an instrument or singing by yourself can be fun, but when we all play and sing together, it sounds beautiful. Student 2 affirmed this notion with a relaxed and happy, *yeah.*

Students wanted to take their kazoos home, but they would be played again on the second visit that week. The researcher placed each kazoo in a plastic bag marked with the students' names. As the students realized they would not be taking their kazoos home that day, Student 4 told me, *I'm going to practice my humming!* This student verbalized an interest in music and in participating in any way possible during the interim while the kazoo was not an option. This is another instance of transfer of learning, in that the student shared the understanding that the activity learned at school can enthusiastically be accomplished at home.

During Weeks 9 and 10, the PPVT posttest was administered to individual target students at a rate of two or three students per visit. This testing took place during the school day prior to the regularly scheduled music activities. Music intervention continued during these last four visits in the form of reviewing songs previously learned.

Week 9 included singing the song, *Colors, I Clap My Hands,* and *Echo Me.* These songs were chosen as the most calming and gentle songs possible to include during the last three weeks of school, when students and teachers tend to be excited and tired before winter break begins. Reviewing the songs offered the opportunity to observe the amount of recall that participants demonstrated in terms of melody, words, body motions and hand movements. In addition, behaviors such as listening, following directions, and exercising patience and social skills, were noted. The students performed the songs with approximately 75% accuracy on the first try, and increasing accuracy for recall of words and melodies upon the second visit.

Week 10 concluded the intervention by completing the PPVT posttest administration and reviewing the songs, *Five Green and Speckled Frogs*, *You'll Sing a Song and I'll Sing a Song, Toe-Leg-Knee,* and *Echo Me.* Several disciplines were reinforced, including listening skills, body part identification, word and melody recall, and social-emotional skills.

Deviations from the Action Plan

Several changes were made to the original, six-week action plan. Before data collection began, the Saint Xavier Institutional Review Board suggested that four weeks be added to the action plan, for two reasons. First, it was customary to implement an action plan over 10 weeks during a semester. Secondly, a longer duration would yield a more comprehensive and accurate picture of the participants' music and language development.

A second change was made when the action plan was introduced to the classroom teachers. After reviewing the plan, the special education teacher suggested to use songs that were less familiar in the research project. The original plan included

basic and sometimes familiar songs designed to give the most challenged student a baseline from which to begin. In light of the teacher's suggestion, further research was conducted at a local public library and more challenging songs were chosen.

The third change to the action plan dealt with the structure of instruction and activity. Initially, the plan called for creating 3x4" pictures of the song's main characters and objects, which would be introduced before and reviewed after each song was sung. Once the pretest was completed and the music activities began, the researcher decided that it would be more appropriate to focus on the music and social interaction of each activity, rather than mimicking the PPVT test-taking process.

To address this change, 2x3' posters were prepared to accompany the K-W-L discussion of two of the songs' main characters and events. The posters offered the same visual appeal as the originally planned pictures, but without focusing too much on the pictures themselves. The remaining songs were not accompanied with a poster, but were augmented through the use of the guitar, a CD recording, instruments, movement, and hand gestures.

The last change that was made involves the administration of the PPVT posttest. Rather than use a corner of the classroom, the posttest was conducted in the multipurpose resource room across the hall from the classroom. The resource room features a corner partitioned with a fabric wall partition to create a quiet corner free from distractions. This location was preferred for the pretest as well, but was not available to use at that time. Administering the posttest in a quieter location allowed participants to focus on the test items without interruptions from their peers.

Presentation and analysis of results

Peabody Picture Vocabulary Test (PPVT)

The PPVT posttest was individually administered during Weeks 9 and 10 of the intervention. Table 5 summarizes the PPVT posttest data and states the percentage increase in CA to AE ratio (Difference in months and percentage) from the pretest to the posttest. Comparing data from Table 1, *PPVT Pretest: Chronological Age (CA) vs. Age Equivalent (AE),* Table 5 data indicates that the average student's pretest AE was 7.1 months, or 8.83% greater than their CA. In contrast, the posttest average student's AE was 19.63 months, or 35.07% greater than the CA. The outcome of the two-month intervention is an average student AE increase of 21.18%.

Table 5

PPVT Posttest: Chronological Age (CA) vs. Age Equivalent (AE)

Student	*Posttest CA (year-month)*	*Posttest AE (year-month)*	*Posttest Difference (months)*	*Pretest Difference (months)*
1	3-8	3-4	– 4	– 9
2	4-5	6-8	26	3
3	4-5	6-7	25	21
4	4-6	4-6	0	20
5	4-6	6-11	29	–24
6	4-6	7-5	35	15
7	4-7	6-2	19	10
8	5-0	6-3	15	7
9	5-0	5-8	8	1
M	4-6	6-1	19-8	7-1

Figure 2

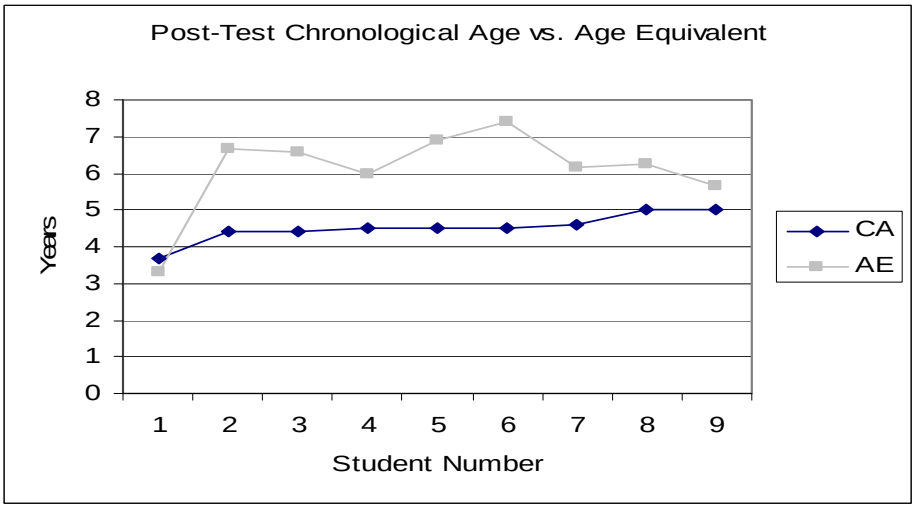


Figure 2 shows results of the posttest, in terms of AE compared with the participant's CA on the date of the test. Compared with Figure 1, students made measurable gains in tested AE from the pretest to the posttest, indicating increases in receptive vocabulary.

Table 6

PPVT Posttest: Eight Most Frequent Items Answered Incorrectly

Word	*Item #*	*Weighted Error %*
camcorder	82	78.00
exhausted	92	66.86
polluting	95	66.86
heart	83	55.71
interviewing	90	55.71
pitcher	93	55.71
reptile	94	55.71
camper	53	55.56
M	85.25	61.27

Table 6 lists the PPVT posttest items that were answered incorrectly by 50% or more of the participants. Over half of the target group missed only eight posttest items compared with eleven pretest items. Of the top eight missed posttest items, five were nouns, two verbs, and one an adjective. This data differs from pretest in several ways.

First, of the top eleven pretest errors, six were verbs, four nouns, and one an adjective. Over the course of the intervention, the target group increased gerund *(-ing* endings) verb identification to a great extent. Noun identification, however, was more difficult in the posttest. Further examination of the individually missed words offers an explanation.

During the pretest, 75% of the frequently missed nouns were body parts. The posttest shows improvements in the understanding of those words. For instance, the

word, *knee,* was missed by 55.56% of participants in the pretest, and by 0% in the posttest. This improvement is largely due to singing the *Toe Leg Knee* song in Weeks 4 and 10 and *I Clap My Hands,* in Week 5. Although the items *nostril* and *heart* were missed by a near and a full majority, respectfully, the intervention did not offer learning opportunities for these specific body parts or organs.

One reason for the most incorrectly answered nouns in the posttest is the pictures from the PPVT test manual. The top posttest missed nouns were *camcorder, pitcher, reptile,* and *camper.* For each of these test items, more than one plausible answer is offered. In addition, the outdated *camcorder* image is irrelevant to today's student, as the PPVT-III version was drafted in 1997.

The PPVT posttest data reveals that 22 pretest items answered incorrectly by a range of 11.11 to 66.67% of participants were answered with 100% accuracy in the posttest, including two of the most commonly missed pretest items, *knee* (55.56% weighted error) and *peeling* (66.67% weighted error). Eighteen items improved by 1 to 10%, nine items by over 20%, four items by over 30%, and one item improved by over 40%. Thirty-five items resulted in no change in weighted percentage error, and seventeen items resulted in a greater weighted percentage error than on the pretest.

Reasons for the decrease in answer correctness from pre to posttest include the statement from NAEYC on child development; that, "development proceeds at varying rates from child to child as well as unevenly within different areas of each child's functioning" (Bredekamp and Rosegrant, p. 22).

The PPVT pretest maximum ceiling item reached by any student was 106, whereas the posttest maximum ceiling item was 131. Item 106 is in the age 9 to 10

receptive vocabulary age range, and item 131 is in the 12 to 14 age range. The posttest, then, resulted in a 3 to 4 year increase in ceiling item achievement.

Of the 25 additional items from item 106 to 131 that were answered in the posttest, eleven items were answered with 100% accuracy, 13 items were answered with an 11% weighted percentage error, and one item was answered with a 22% weighted error.

Table 7

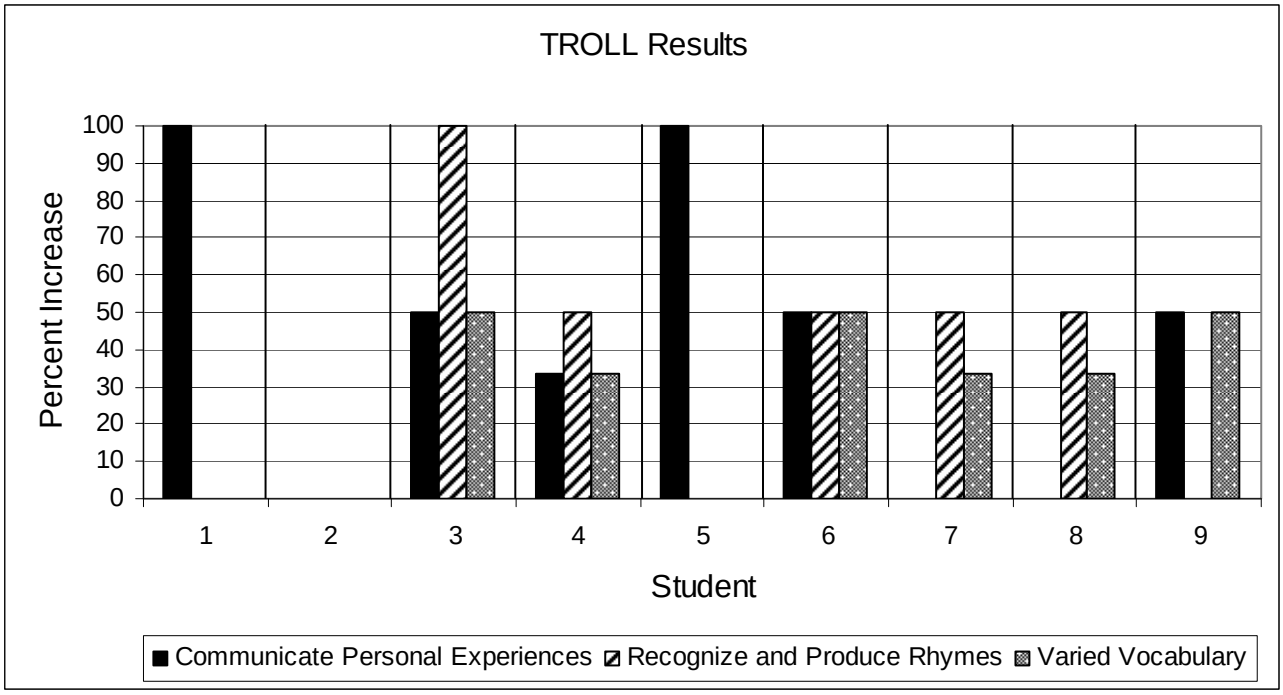
Teacher Rating of Language and Literacy (TROLL)

Student	Communicate Personal Experiences		Recognize and Produce Rhymes		Use a Varied Vocabulary or try out New Words	
	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
1	I	II	I	I	II	II
2	III	III	II	II	II	II
3	II	III	I	II	II	III
4	III	IIII	II	III	III	IIII
5	I	II	I	I	II	II
6	II	III	II	III	II	III
7	IIII	IIII	II	III	III	IIII
8	IIII	IIII	II	III	III	IIII
9	II	III	I	I	II	III
Increase	43%		33%		28%	

Table 7 depicts the teacher ratings of targeted students' development in three areas of language: the ability to communicate personal experiences, recognize and produce rhymes, and to use new vocabulary terms. Each category reflects improvement as a group, with the ability to communicate personal experiences at the top of the list. Figure 3 depicts increases in TROLL scores for individual participants. Noteworthy data is seen for Students 1 and 5, who in the pretest and during the intervention were the most nonverbal students among the target population. Student 5 in particular became noticeably conversational when the PPVT posttest items depicted animals. This student shared many animal stories with the researcher after the posttest administration.

Figure 3

Increase in TROLL ratings, from pretest to posttest



Journal Commentary

During Week 9, the parent of Student 2 commented after class that the student enjoys playing the kazoo at home. The parent said that the recent addition of a new baby has negatively impacted Student 2, who has reacted with jealousy and behavioral challenges. The student's kazoo, the mother said, is an activity just for the student; the baby cannot share the toy. In this way, the kazoo provides an extension of the child's sense of self, and has positively influenced the student's sense of pride, ownership, identity and self-esteem.

During a brief visit to the school after Week 10, the classroom teachers stated that the students continue to ask to sing songs from the intervention. The teachers shared their observations of the students' enthusiasm for the music, ability to recall lyrics, melodies, hand gestures and body movements. The extension of these practices

into the regular classroom experience is evidence of the positive impact that the music intervention has had on the students' listening, singing and social emotional skills.

CHAPTER 5

Conclusions and Recommendations

In conclusion the data from this intervention indicate that implementing hands-on, content integrated music activities can increase receptive language skills in the at-risk early childhood population. Recommendations for future research include conducting an intervention over an entire school year to increase data accuracy and intensity. Introducing ever more complex music and language skills would give participants the opportunity to expand music and language development even further. For instance, the researcher could guide participants in exploring the traditional Solfege syllables and applying them to familiar songs or help create new melodies.

The most recent edition of the PPVT (version IV), was issued in August, 2006, and features larger illustrations in full color and more realistic artwork (Pearson, 2007). Using the most recent edition is likely to produce more accurate data.

Finally, encouraging and planning for participation from caregivers throughout the school year would greatly add to the depth of the musical experience. Family members could share their own cultural music as well as participate with the students to foster a musical connection between school and home environments.

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APPENDIX A – INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

SAINT·XAVIER·UNIVERSITY

September 24, 2006

Re: "Implementing Music Activities to Increase Language Skills in the At-Risk Early Childhood Population"

Approval Number: FA06162AP0924

Dear Elissa Seeman

Thank you for submitting the documentation requested by the IRB for the research project named above. The IRB has determined that all procedures are in compliance with university and federal guidelines governing protection of rights of human subjects. Your request for approval is hereby granted. You may begin collecting data for your project at any time.

Please note that institutional and federal regulations require that any changes in data collection procedures, sampling design, record keeping procedures, or other aspects of the research protocol must be immediately reported to the Institutional Review Board. In addition, if you extend data collection beyond the dates that you provided on Form A, you should notify the IRB. Please include the IRB approval number in any correspondence.

This is the only letter you will be sent. Please print a copy of this message for your records. If you have any questions, or if you require a hard copy of this letter, contact me at (773) 298-3487 or by email at hilton@sxu.edu.

Best wishes for success with your research project!

Sincerely,

Peter Hilton, Ph.D., SOE
Co-Chair
Saint Xavier University
Institutional Review Board

APPENDIX B – PARENT CONSENT LETTER

SAINT·XAVIER·UNIVERSITY

Consent to Participate in a Research Study
IMPLEMENTATION OF MUSIC ACTIVITIES TO INCREASE LANGUAGE SKILLS IN THE EARLY CHILDHOOD POPULATION

Dear Parent or Guardian,

I am currently enrolled in a master's degree program at Saint Xavier University. This program requires me to design and implement a project on an issue that directly affects my instruction. I have chosen to examine the role of music activities in enhancing the development of language skills in early childhood.

The purpose of this project is to examine how music activities promote social, musical, and language skills in young children. As a musician and future teacher, I am interested in bringing music into the classroom to encourage students' musical development and enjoyment. The music activities involved in this project may help your student develop music skills such as singing, clapping hands, and playing instruments. In addition, as music is a non-verbal and symbolic language that children enjoy from a young age, the music activities may offer a bridge from musical to verbal language. In this way, your student's language development may increase as a result of participating in the musical activities.

I will be conducting my project from October 10, to December 15, 2006. The activities related to the project will take place during regular instructional delivery. During 10-minute visits twice a week, I will lead the students in singing familiar songs. First I will show pictures of the main characters and objects from the song. Next, we will sing the song together. Last, I will present the pictures again, and ask the students to identify the names of the characters and objects from the song. In this way, I will measure increased student vocabulary over the course of 10 weeks.

The beginning and end of the study will include an individually administered test called the Peabody Picture Vocabulary Test (PPVT), which will provide an understanding of students' present vocabulary. In addition, I will complete a checklist after each visit to document progress in the areas of vocabulary, and ability to rhyme and use rhythm. Finally, the classroom teacher will complete a journal over the course of the study to provide feedback on student understanding. The only physical requirements for participation in this study are the ability to hear, clap hands, sing, and tap feet. The gathering of information for my project during these activities offers no risks of any kind to your child.

Your permission allows me to include your student in the reporting of information for my project. All information gathered will be kept completely confidential, and information included in the project report will be grouped so that no individual can be identified. The report will be used to share what I have learned as a result of this project with other professionals in the field of education.

Participation in this study is completely voluntary. You may choose to withdraw from the study at any time. If you choose not to participate, information gathered about your student will not be included in the report.

If you have any questions or would like further information about my project, please contact me at my home phone, cell phone, or by email.

If you agree to have your student participate in the project, please sign the attached statement and return it to me. I will be happy to provide you with a copy of the statement if you wish.

Sincerely,

Elissa Seeman

PLEASE RETURN THE ATTACHED STATEMENT TO ME BY Monday October 9, 2006.

Consent to Participate in a Research Study
IMPLEMENTATION OF MUSIC IN AN EARLY CHILDHOOD PROGRAM TO INCREASE LANGUAGE SKILLS

I, _____, the parent/legal guardian of the minor named below, acknowledge that the researcher has explained to me the purpose of this research, identified any risks involved, and offered to answer any questions I may have about the nature of my child's participation. I freely and voluntarily consent to my child's participation in this project. I understand all information gathered during this project will be completely confidential. I also understand that I may keep a copy of this consent form for my own information.

NAME OF MINOR: _____

_____

Signature of Parent/Legal Guardian Date

APPENDIX C – PPVT TEST ITEMS

PPVT ITEMS

Age 2.6 to 3
1 bus
2 drinking
3 hand
4 climbing
5 key
6 reading
7 closet
8 jumping
9 lamp
10 helicopter
11 smelling
12 fly

Age 4
13 digging
14 cow
15 drum
16 feather
17 painting
18 cage
19 knee
20 wrapping
21 fence
22 elbow
23 garbage
24 exercising

Age 5
25 empty
26 shoulder
27 square
28 measuring
29 porcupine
30 arrow
31 peeling
32 fountain
33 accident
34 penguin
35 decorated
36 nest
37 castle
38 sawing
39 cactus
40 farm
41 going
42 harp
43 astronaut
44 raccoon
45 juggling
46 envelope
47 tearing
48 claw

Age 6-7
49 parachute
50 delivering
51 rectangle
52 diving
53 camper
54 target
55 writing
56 furry
57 drilling
58 hook
59 group
60 dripping
61 vehicle
62 oval
63 luggage
64 awarding
65 hydrant
66 swamp
67 calculator
68 signal
69 squash
70 globe
71 vegetable
72 frame

Age 8-9
73 gigantic
74 nostril
75 vase
76 knight
77 towing
78 horrified
79 trunk
80 selecting
81 island
82 camcorder
83 heart
84 wrench

Age 9-10
85 flamingo
86 tambourine
87 palm
88 surprised
89 canoe
90 interviewing
91 clarinet
92 exhausted
93 pitcher
94 reptile
95 polluting
96 vine
97 pedal
98 dissecting
99 bouquet
100 rodent
101 inhaling
102 valley
103 tubular
104 demolishing
105 tusk
106 adjustable
107 fern
108 hurdling

Age 12-16
109 solo
110 citrus
111 inflated
112 lecturing
113 timer
114 injecting
115 links
116 cooperating
117 microscope
118 archery
119 garment
120 fragile
121 carpenter
122 dilapidated
123 hazardous
124 adapter
125 valve
126 isolation
127 feline
128 wailing
129 coast
130 appliance

Age 12-16, cont'd
131 foundation
132 hatchet
133 blazing
134 mammal
135 reprimanding
136 upholstery
137 hoisting
138 exterior
139 consuming
140 pastry
141 cornea
142 constrained
143 pedestrian
144 colt

Age 17 to adult
145 syringe
146 transparent
147 ladle
148 replenishing
149 abrasive
150 parallelogram
151 cascade
152 lever
153 detonation
154 pillar
155 cultivating
156 aquatic
157 indigent
158 oasis
159 disappointed
160 perpendicular
161 poultry
162 confiding
163 periodical
164 filtration
165 primate
166 spherical
167 talon
168 octagon
169 incandescent
170 pilfering
171 trajectory
172 mercantile
173 derrick
174 ascending

Age 17 to adult, cont'd
175 monetary
176 entomologist
177 gaff
178 quintet
179 nautical
180 incarcerating
181 coniferous
182 wildebeest
183 caster
184 reposing
185 convex
186 gourmand
187 dromedary
188 diverging
189 incertitude
190 quiescent
191 honing
192 cupola
193 embossed
194 perambulating
195 arable
196 importunity
197 cenotaph
198 tonsorial
199 nidificating
200 terpsichorean
201 cairn
202 osculating
203 vitreous
204 lugubrious

APPENDIX D – TROLL RATING SCALE

Teacher Rating of Oral Language and Literacy (TROLL)

David K. Dickinson
Center for Children & Families, EDC

LANGUAGE USE:

1. How well does the child communicate personal experiences in a clear and logical way?

Assign the score that best describes this child when he/she is attempting to tell an adult about events that happened at home or some other place where you were not present.

Child is very tentative, only offers a few words, or requires you to ask questions. Has difficulty responding to questions you ask.	Child offers some information, but information needed to really understand the event is missing (e.g., where or when it happened, who was present, the sequence of what happened).	Child offers information and sometimes includes the necessary information to really understand the event.	Child freely offers information and tells experiences in a way that is nearly always complete, well sequenced, and comprehensible.
1	2	3	4

2. How would you describe the child's ability to recognize and produce rhymes?

Child cannot ever say if two words rhyme and cannot produce a rhyme when given examples (e.g., rat, cat, __).	Child occasionally produces or identifies rhymes when given help.	Child spontaneously produces rhymes and can sometimes tell when word pairs rhyme.	Child spontaneously rhymes words of more than one syllable and always identifies whether words rhyme.
1	2	3	4

3. How often does (CHILD) use a varied vocabulary or try out new words (e.g. heard in stories or from teacher?

Never 1	Rarely 2	Sometimes 3	Often 4

APPENDIX E– JOURNAL COMMENTARY

Verbal Commentary	
Date	Comment
10/24/06	Student 8 used the word, “speckled” to describe a spotted leaf (after singing 5 Green and Speckled Frogs) This date was a Tuesday during the third week of the intervention, the second week of singing, and only the third visit of formal singing.
12/12/06	Parent of Student #2 remarks that student is proud of and plays kazoo and sings songs at home. Kazoo is a toy just for the student and cannot be shared with the new baby. Ownership and identity.
12/21/06	Delivered photos to students and teachers Teachers said the class continues to ask for the music Class continues to sing songs from intervention

APPENDIX F – LIST OF SONGS IMPLEMENTED

Appendix F - List of Songs Implemented

Week	Song
1	1. Twinkle, Twinkle, Little Star
	2. If You're Happy and You Know It
	3. Alphabet Song
	4. Old MacDonald
2	Colors
	Author: Hap Palmer
	Recording: Learning Basic Skills Through Music, 1969
3	Five Green and Speckled Frogs
	Author: Raffi
	Recording: Singable Songs for the Very Young, 1976
4	Toe Leg Knee and Knuckles Knees
	Author: Jim Gill
	Recording: Jim Gill Sings Do-Re-Mi on his Toe-Leg-Knee, 1999
5	Percussion Instruments Played to Children's Favorites CD
	I Clap My Hands - (Song not documented on CD)

6 Echo Me

Author: Kathy Poelker

Recording: Amazing Musical Moments, 1985

7 *11/21 - 11/23 - Thanksgiving Holiday; no visits*

8 You'll Sing a Song and I'll Sing a Song

Author: Ella Jenkins

Recording: You Sing a Song and I'll Sing a Song, 1966

9 Song Review:

Colors

I Clap My Hands

Echo Me

10 Song Review:

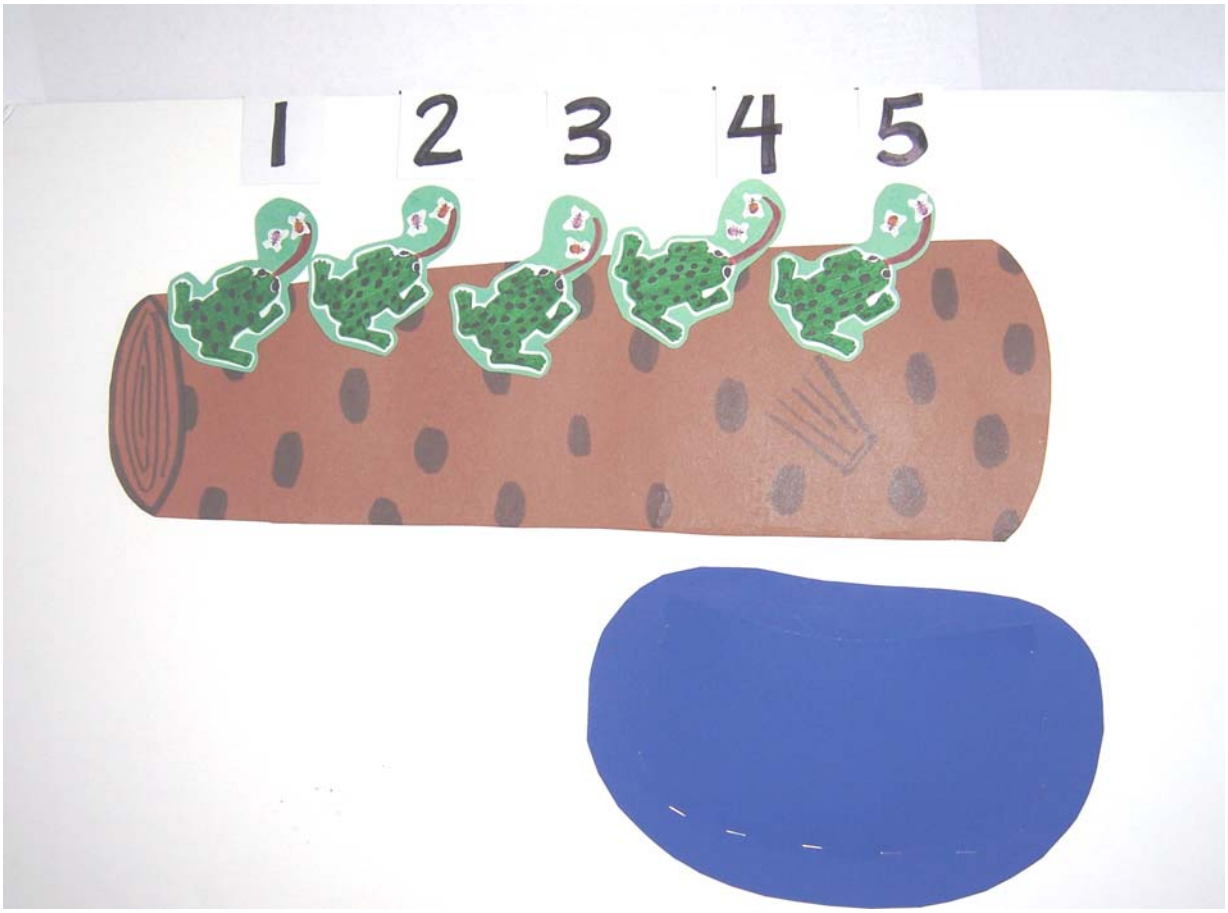
Five Green and Speckled Frogs

You'll Sing a Song and I'll Sing a Song

Toe Leg Knee

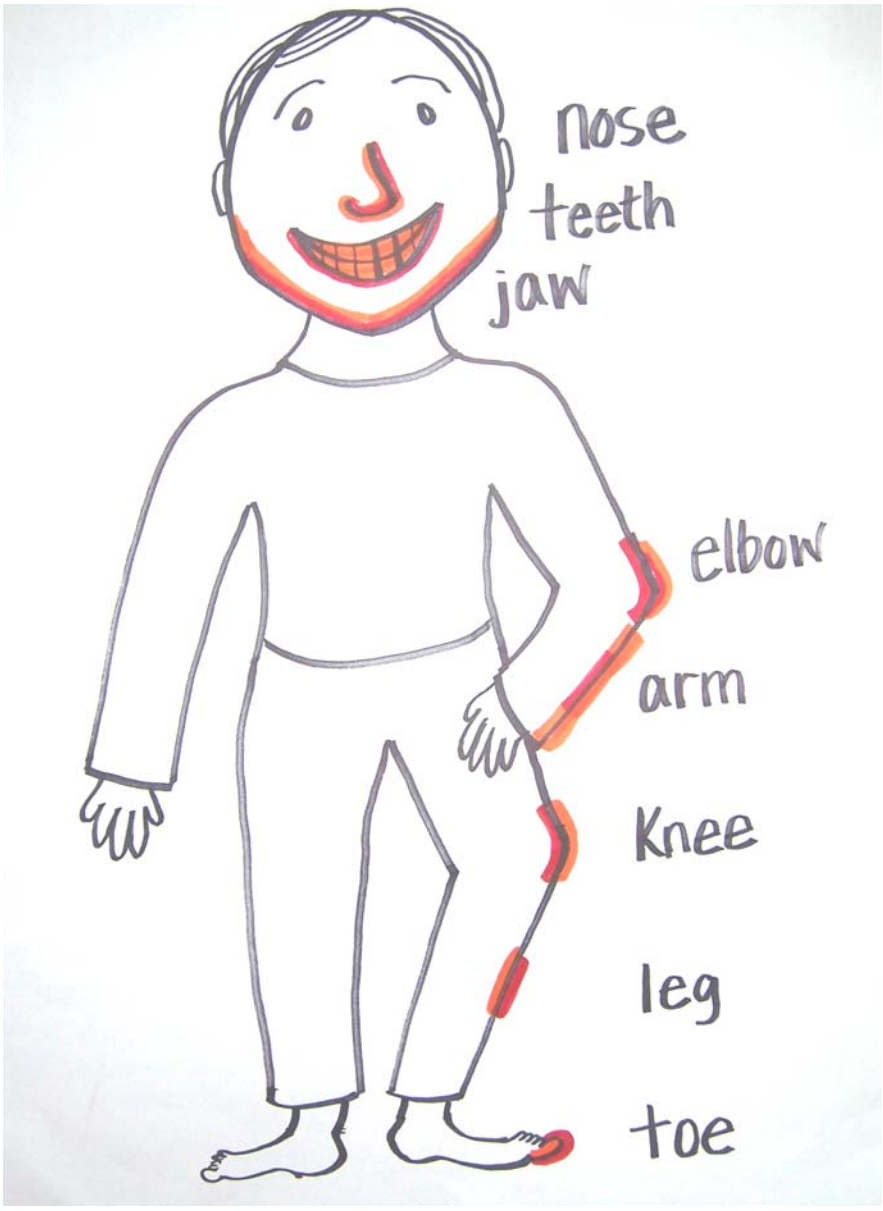
Echo Me

APPENDIX G – *FIVE GREEN AND SPECKLED FROGS* POSTER



Poster implemented in Weeks 3 and 10: *Five Green and Speckled Frogs*

Appendix H: *TOE LEG KNEE* POSTER



Poster implemented in Weeks 4 and 10: *Toe Leg Knee*

Implementation of music activities to increase language skills in the at-risk early childhood population

Elissa Seeman

Problem Statement

Early childhood students who are
at-risk for academic failure
or have special needs
may be susceptible
to language delay.

Problem Evidence

Language Assessments

- Peabody Picture Vocabulary Test (PPVT-III)
- Teacher Rating of Oral Language Learning (TROLL)
- Teacher observations of gaps in areas of phonemic awareness

Target Group

Nine, aged 3 to 4
year old students,
who are at-risk
for academic failure

Probable Causes

- Atypical language development due to hearing impairment, mental retardation, autistic spectrum disorder or specific language impairment
- At-risk factors:

divorce, foster status, single parenthood, low socioeconomic status, low birth weight, premature birth, or at-risk health condition at birth

Solution Strategy

Music skills correlate significantly
with phonological awareness
and reading performance,
sharing the same auditory and cognitive
proficiency needed for reading,
while using unique processing skills.

- Anvari study, 2002

Action Plan

- 10-week intervention
- October - December, 2006
- Twice weekly visits
- PPVT Pretest and Posttest
- TROLL Phonemic Awareness Rating Scale
- Teacher Journals
- Parental Feedback

- Sequential musical challenges
- Songs that feature most frequently missed pretest words
- Guitar and singing
- Wood instruments and kazoos
- Solfege (do-re-mi)
- ASL (American Sign Language)

Figure 1

PPVT Pretest Scores: Chronological Age (CA) and Normed Age Equivalents (AE)

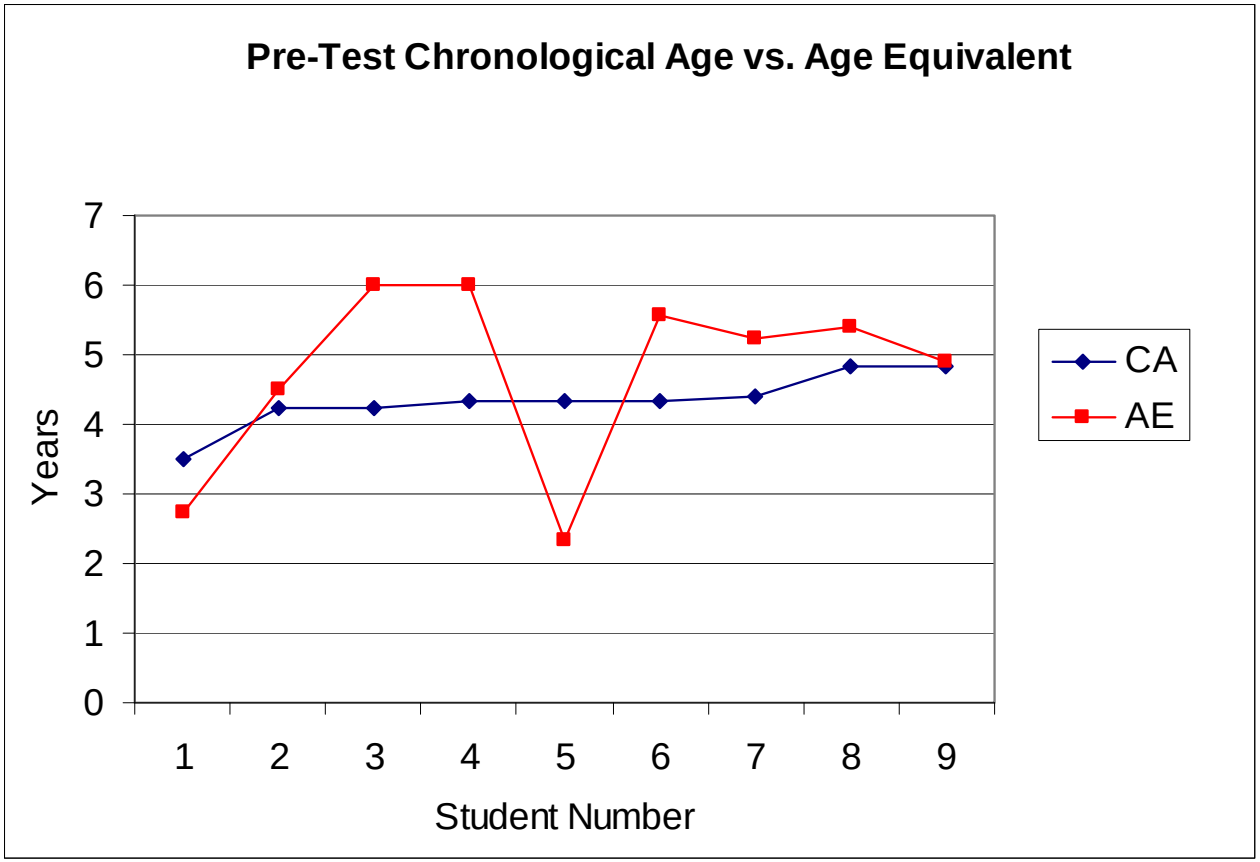
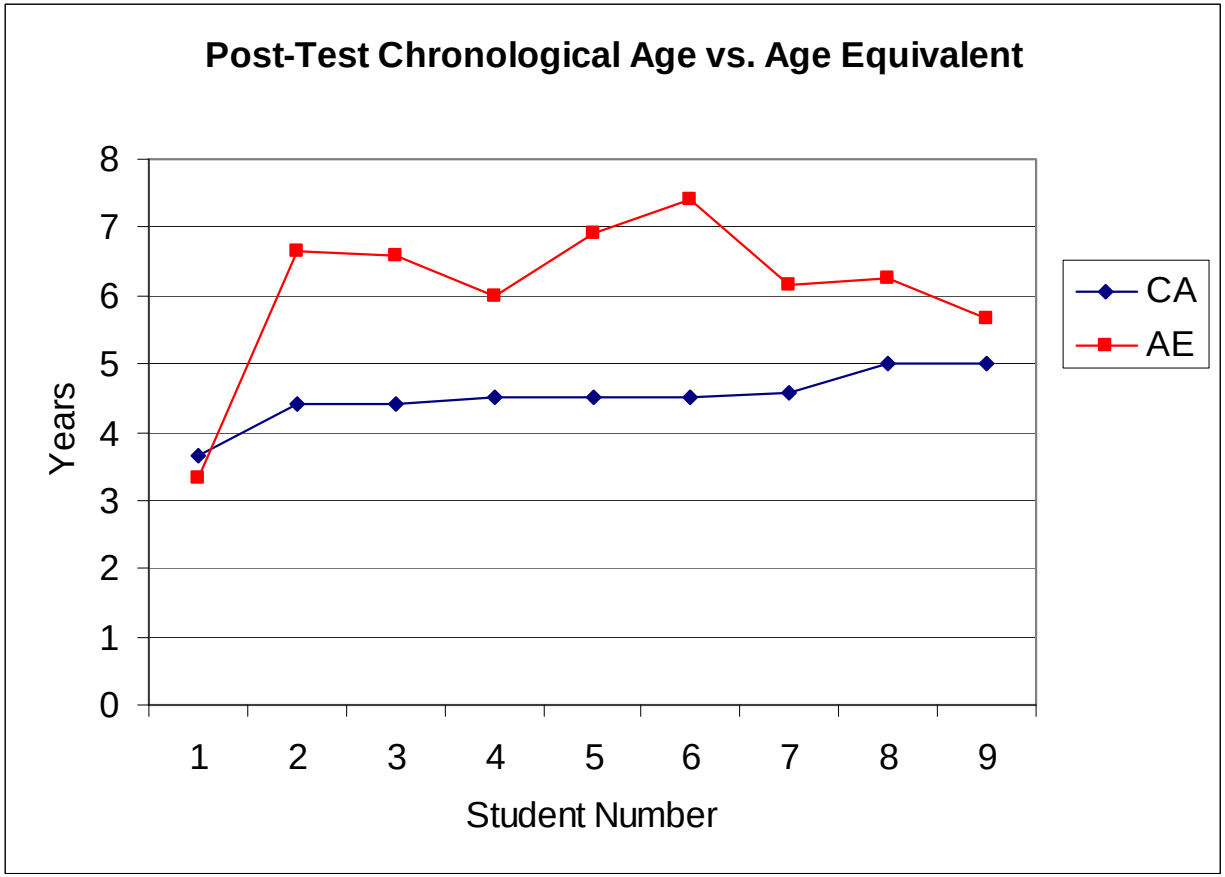
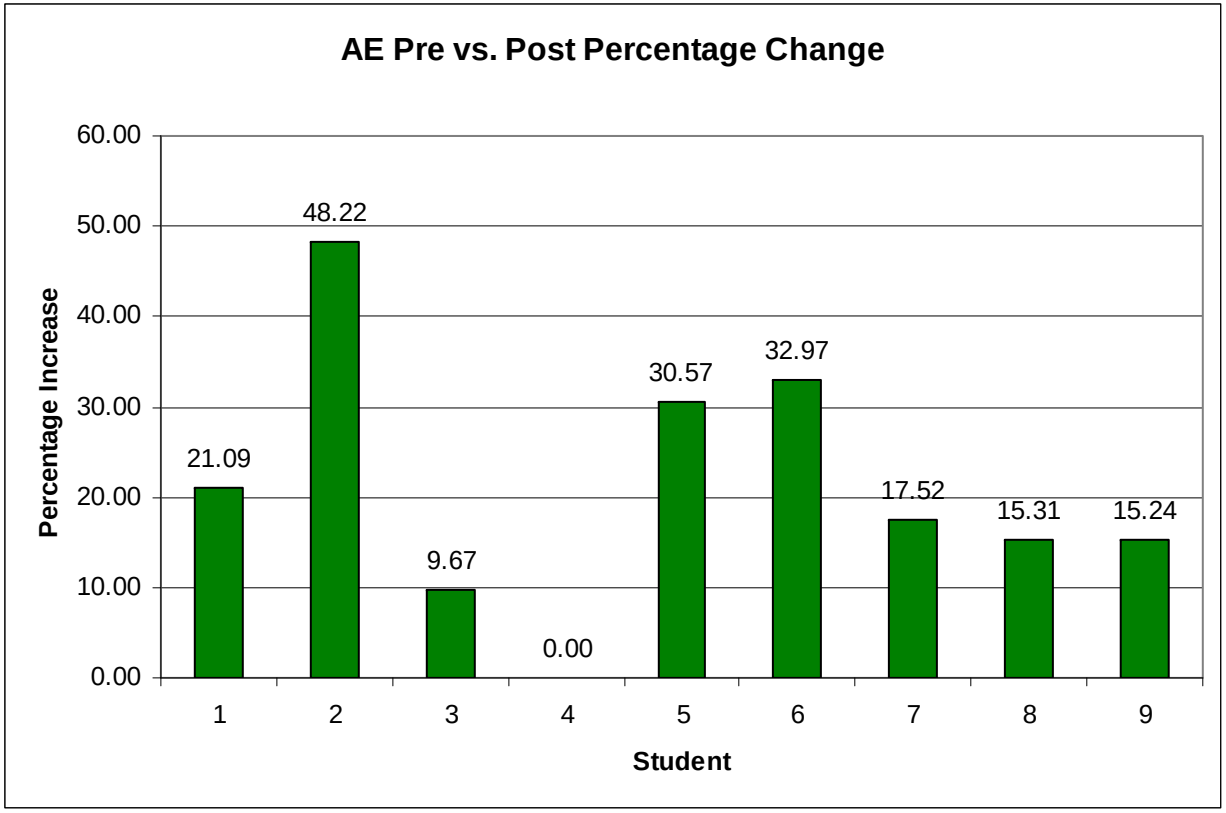


Figure 2

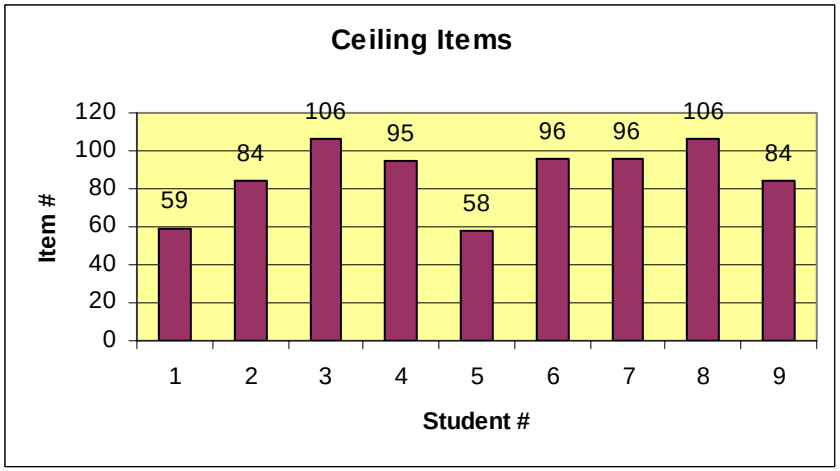
PPVT Posttest Scores: Chronological Age (CA) and Normed Age Equivalents (AE)



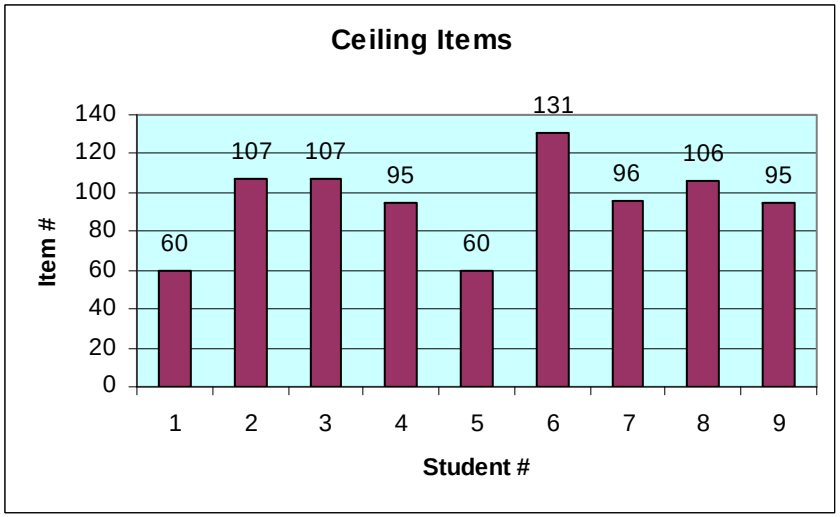
Pretest to Posttest Percentage Change in Tested Age Equivalents



Ceiling Items Pretest vs. Posttest

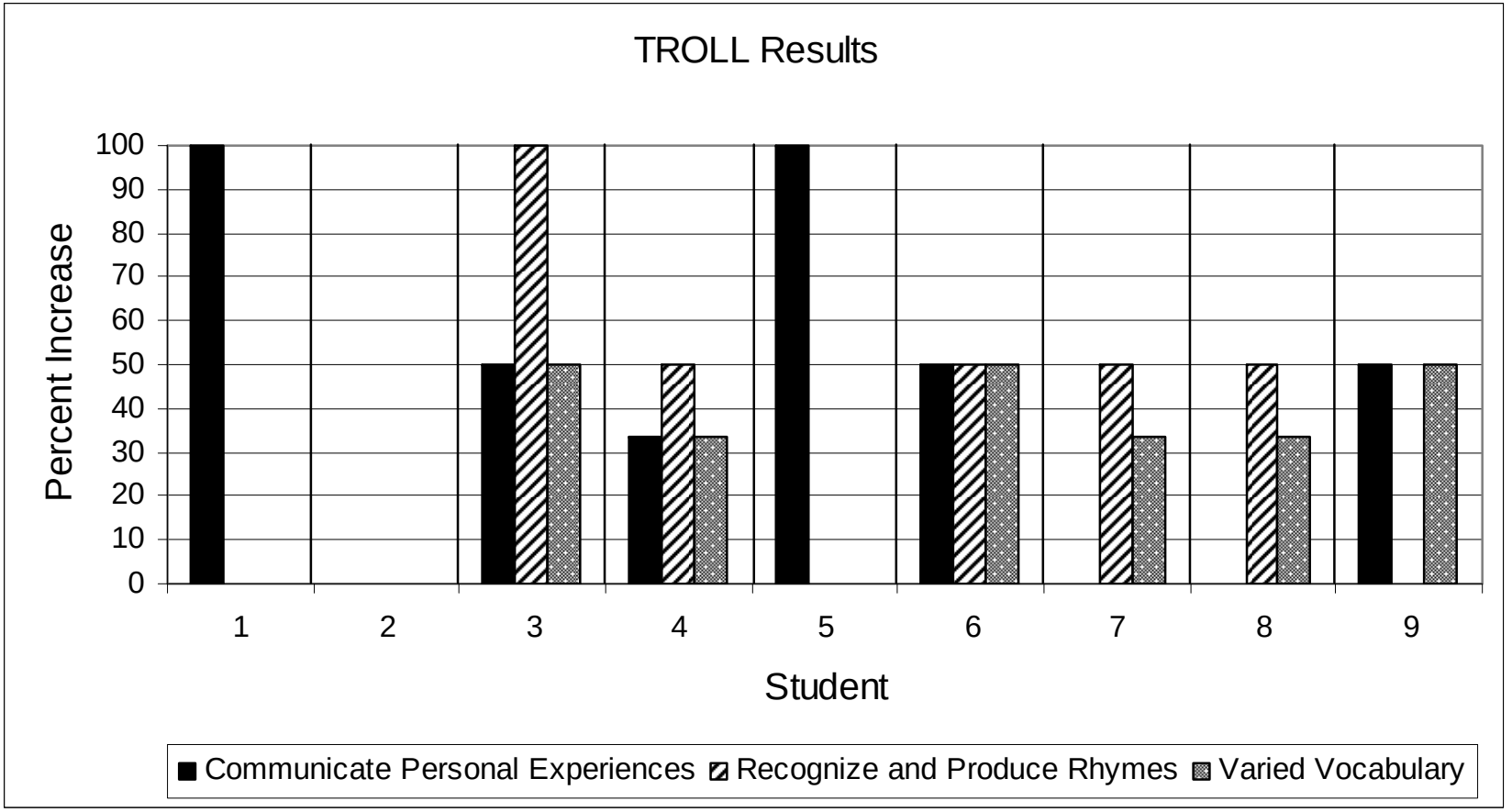


Pretest



Posttest

Phonemic Awareness Development
Percent Increase from Pretest to Posttest



Results

Receptive Vocabulary increased

an average of 21.18%

(0% - 48.22%)

Phonemic Awareness increased

an average of 34.67%

(28% - 43%)

Results *continued*

ASL (American Sign Language)

facilitated participation of initially non-participatory students

Self Esteem

- Increased sense of musical identity
- Increased expressive language in group settings

Results *continued*

Continued Practice

At students' requests,
teachers instructed the music activities
after the intervention was completed

Conclusions

Hands-on, content-integrated music activities can increase receptive language skills in the at-risk early childhood population

Insights

The ear is one of the first developed sensory organs

Newborns prefer to hear sounds they heard while in utero

Everybody has a sense of music

Recommendations

- Research to be conducted over an entire school year
- Incorporation of ever more complex music skills
- More intricate measurements of association between music and language

Key References

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