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THE EFFECTS OF MUSIC IMPROVISATION INSTRUCTION ON ELEMENTARY STUDENTS' TONAL SINGING ACHIEVEMENT AND DEVELOPMENTAL TONAL APTITUDE

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THE EFFECTS OF MUSIC IMPROVISATION INSTRUCTION ON ELEMENTARY STUDENTS' TONAL SINGING ACHIEVEMENT. AND DEVELOPMENTAL TONAL APTITUDE

By

Emily Jambeau

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ABSTRACT

THE EFFECTS OF MUSIC IMPROVISATION INSTRUCTION ON ELEMENTARY STUDENTS' TONAL SINGING ACHIEVEMENT AND DEVELOPMENTAL TONAL APTITUDE

By

Emily Jambeau

The purpose of this study was to investigate the effects of vocal improvisation instruction on the development of tonal singing achievement and tonal developmental aptitude. The problems of the study compared the tonal singing achievement and tonal aptitude gains of first grade students in control and experimental groups.

Three intact classes (N=43) were assigned to the no improvisation control group, and three intact classes were assigned to the improvisation experimental group (N=50). All participants were given the *Primary Measures of Music Audiation (PMMA)* as a pre-test and were recorded and rated for tonal singing achievement by two independent judges using a researcher-designed, five-point rating scale.

Treatment included two 30-minute periods each week for 28 weeks. Students in the experimental group were given seven minutes each period to improvise patterns in group and in solo in major and minor tonalities and song endings over chords roots. The remainder of the time students in the treatment group received identical instruction as the control group including movement, singing, chanting and playing instruments. After the treatment period, PMMA was re-administered, and recorded singing performances were rated by two independent judges. There were no significant differences between the control and experimental groups in developmental music aptitude or singing intonation as a result of treatment.

I would like to dedicate this work to my family for all the love and support they have given me through all of my pursuits.

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CHAPTER ONE

LITERATURE REVIEW

Role of Music Improvisation in Music Education

Improvisation is important to musical achievement, because it goes beyond simple imitation, memorization, or performance of written notes. "It ranks near the top in complexity of its cognitive components," states Campbell (1991). Music improvisation fosters independent musicianship and requires a student to make inferences, which require higher order thinking skills (Della Pietra & Campbell, 1995; Gordon, 2003a). It requires persons to draw appropriate musical patterns from their vocabulary and use them in novel ways in the context of unfamiliar musical situations. To improvise successfully requires an understanding of musical syntax, the orderly arrangement of sounds. In a broad Western description, to make musical sense, improvisation makes use of clarity of meter and tonality, a sense of tension and release, a clear beginning and end, antecedent and consequent phrases, and an appropriate musical style (Sarath 2002). Improvisation can be an indicator of what a person understands and can manipulate in his or her musical mind and can serve as a trustworthy way of measuring that understanding.

Content Standard #3 of The National Standards in Music Education (1994) states that all elementary students should able to improvise melodies, variations, and accompaniments. Many music educators, professors, researchers, and associations have promoted the development of student's improvisation skills and have expressed the need for improvisation to be an essential part of children's musical growth from the earliest stages of the educational process (Azzara, 2002; Della Pietra & Campbell, 1995;

Dobbins, 1980; National Association of Schools of Music, 1999). While improvisation is recognized nationally as an essential skill, many schools downplay it in their curricula, if they mention it at all (Azzara, 2002; Campbell, 1991; Jorgensen, 1997; Sarath, 2002; Schmidt & Sinor, 1986; Webster, 1987). Improvisation is commonly thought of in the context of jazz, though it can be explored in any number of musical styles with a Western context (Campbell, 1991). American music education at all levels is found to be geared largely towards performance, be it for an elementary school musical or a high school band concert, and improvisation is rarely used in those performances (Sarath, 2002; Sawyer, 1999). University-level music curriculums rarely require music education degree students to take classes in improvisation, which explains why many music teachers feel ill-equipped to teach it (Della Pietra & Campbell, 1995; Jorgensen, 1997).

Music exploration, creativity, improvisation and composition often are used interchangeably in conversation; however they are not the same. These activities could be thought of as a continuum of musical intentionality. Exploration allows a person to produce freely with little to no musical intent. Instead of working toward a product, a musical explorer is simply experimenting with the different possibilities of sounds. Kratus's (1996) study of children's creativity processes is helpful in distinguishing differences between exploration and improvisation. He states, "A student who explores cannot audiate the sounds as they are created" (p. 31). The sounds are not required to have any syntactical musical meaning. An example of exploration would be for a child to test out pentatonic sounds on a tonebar instrument, sometimes randomly and sometimes in a different visual order. An example of a vocal exploration would be a child experimenting with the high and low registers of his or her voice in a random fashion.

This is not improvisation, because the child was not asked to create within a specific tonal and/or metric context.

Creativity, on the other hand, does require that sounds fit into a specific tonal and metric context. It must have a sense of a tonal center and/or a rhythmic syntax. It involves more intent, but does not require correctness on multiple levels. As opposed to in exploration, in creativity, musical sounds are audiated before they are created. For example, a student may be asked to create patterns between repetitions of a song that fit in the tonal context of a song, or a child could substitute a created phrase in place of one already in the song. In creativity, maintaining tonality and meter are essential, but specific tonal or rhythm functions are not required as in improvisation.

At the far end of the continuum of intentionality is composition. Composition is often seen as a created work that is written down, although a composition could also be completed without notation if the composer revises it internally and is able to replicate it in performance. Kratus observes, "The main difference between composition and improvisation as a product is that in composition the creator has time to revise musical ideas, allowing for greater intentionality than in improvisation, in which no revision is possible" (Kratus, 1991).

Improvisation differs from exploration, creativity, and composition. To make musical sense, an improvisation requires correctness on multiple levels. Improvisation not only requires correct tonal and metric syntax, it requires meaningful chord progressions, a sense of tension and release, a clear beginning and end, antecedent and consequent phrases, and an appropriate musical style (Sarath 2002). Azzara (1993) describes improvisation as follows:

> Spontaneous performance is not the expression of aimless, random tonal and rhythm patterns. It is the meaningful manipulation of tonal and rhythm music content created in ongoing musical thought. (p. 330)

Improvisation is to music what conversation is to language (Gordon, 2003a). People improvise in extra-musical ways through conversation daily. Their improvisations with language have a preset context, grammar, and sentence structure, and they convey a desired meaning. Certain types of music improvisation can be conversation-like in nature when musicians dialogue back and forth within preset parameters (Sarah 2002). Given the right musical environment, a child might speak music (improvise) as easily as she speaks her own language.

Even with its general absence in schools, its value as a lifelong skill, and priority in the National Standards for Music Education, music improvisation has not been the focus of extensive research. Azzara (1993) examined the effects of aural/oral improvisation experiences on student achievement in music reading and found that students who received improvisation instruction achieved higher scores on music reading tests than those who did not receive improvisation instruction. Guilbault (2003) investigated whether harmonic accompaniment would affect the quality of student improvisations, but the present study is concerned with the opposite, the effect of improvisation on achievement, not achievement on improvisation. Beyond these studies, there is little research focusing on improvisation, save studies that analyze student creativity or composition, which is not the subject of the present study. Perhaps, if the benefits of music improvisation were clearer and supported by additional research, music improvisation would have more of a presence in the larger music education community.

This study will focus on improvisation as a potential means of developing music aptitude and improving singing achievement.

Role of Singing Achievement in Music Education

Since it was first included in United States public school curricula in 1838, singing has been considered fundamental to music education and society (Abeles, et al, 1994). Throughout life, all people participate in events that require them to sing. (Feieraband, 1992). Singing can be considered the most basic, most personal form of musical expression (Rutkowski, 1996). The National Standards in Music Education (1994) include singing with accurate intonation as a skill that all elementary students should master. Specifically, singing independently with accurate intonation is part of Content Standard #1. Many school music settings require children to sing in groups, but rarely alone (Jorgensen, 1997). Thus, some children may find it difficult to monitor their own singing, because other voices are always present (Rutkowski & Miller, 2003) and some children never develop an ability to sing in tune without imitating a nearby singer (Gordon, 2003b). Many people are uncomfortable singing, because they lack confidence in their singing skills. Even with research findings that identify helpful techniques for improving singing achievement, some children exit formal music instruction unable to sing accurately (Rutkowski & Miller, 2003). It would follow that discovering effective types of instruction for improving a person's ability to sing in tune would be of great worth.

Numerous researchers have dedicated their efforts to learning what influences a person's ability to sing in tune (Atterbury and Silcox, 1993; Gilbault, 2003; Goetze,

1985; Lange 2000; Levinowitz, 1987,1989; Rutkowski, 1996; and Stauffer, 1985). Atterbury and Silcox (1993) provided harmonic accompaniment using a piano as treatment and found no significant difference in kindergartner's ability to sing in tune compared with those who had no piano accompaniment. Guilbault (2003) observed the effect of chord root accompaniment on a child's ability to sing in tune and improvise. She found no difference in singing achievement as a result of treatment, but found that chord root accompaniment significantly affected the quality of student improvisations. Stauffer (1985) examined the effects of echo-training in melodic and harmonic contexts on singing achievement and found no significant difference according to treatment, even though test scores improved for all treatment groups. Goetze (1985) discovered students sang more accurately in solo on a neutral "loo" syllable then in groups and with text. Levinowitz (1987/1989) and Lange (2000) found conflicting evidence about the use of text when studying the effect of text versus no text on ability to sing in tune. Levinowitz's 1987 study found neither of the treatments were superior, but her 1989 study found that neutral syllable singing had a positive effect on ability to sing in tune. Lange (2000) found no significant difference between her text and no text groups. Rutkowski (1996) found a significant difference favoring small group/individual instruction when comparing the effects of large group versus small group/individual singing instruction on subjects' ability to sing in tune. There are no studies that examine the effect of sequential improvisation instruction on singing achievement.

Music Aptitude Versus Music Achievement

In music education, achievement, such as singing in tune is often confused with aptitude, which is one's potential to learn a musical skill. However, as a result of research, the difference between music achievement and music aptitude has become increasingly clear. Whereas music achievement is the actual accomplishment of musical tasks, music aptitude is a measure of potential or speed and ease with which one learns music (Gordon, 1980, 1986, 1998a, 2003a, 2003b).

For years, it was believed by the general population that musical ability was an inborn trait (Evans, Bickel, & Pendarvis, 2000; Gembris & Davidson, 2002; Schoen, 1940; Seashore, 1919). Then the great nature versus nurture debate transpired, in which one side believed music aptitude was innate or hereditary while the other thought it was environmentally influenced. In the early 1900s, psychologists were extremists and maintained one-sided positions on the issue (Farnsworth, 1969). European psychologist, such as Stumpf, Hatherly Pear, Revsez, Schoen, and Rupp, studied music prodigies and inferred that their genius was inborn (Revsez, 1954; Schoen, 1940). Of the same frame of mind was Seashore, who developed the *Measures of Musical Talent* to test a child's music aptitude (Seashore, 1919). These and other theorists believed intellectual capacity, including music, unfolds automatically and is not affected by the environment (Hunt, 1961).

Operating under the same belief, Haecker and Ziehen, Koch and Mjoen, and Feis, interviewed musical and non-musical parents and children and concluded in support of heredity (Schoen, 1940). They found that, if both parents are musical, it is likely that their children would be musical, and if neither parent is musical, children will be even less

musical than their parents (Gordon, 1998). However, musical geniuses Handel, Rubinstein and Toscanini came from families whose parents were not particularly musical (Fisher, 1973; Kenneson, 1998). Bach and Mozart came from musical families, but their genius could just as easily be attributed to early musical stimulation as to inheritance (Lundin, 1967).

The theory that aptitude was innate and fixed for life was challenged in extra-musical fields in the early 1900s by psychologists in the nurture "camp." Freeman, Holzinger and Mitchell's (1928) as well as Burke's (1928) studies found significant improvements in IQ for orphans who were placed in good foster homes. Psychologist Watson (1913) was known as an extreme environmentalist. Other environmentalist researchers, including Gordon (1933), Hirsch (1933), and Thorndike (1933), supported the notion that aptitude is changeable over time as a result of environmental exposure (Vernon, 1979).

In the latter part of the 20th century, music psychologists, such as Lundin and Farnsworth, believed that nature and nurture contributed to music aptitude (Farnsworth, 1969; Lundin, 1967). Piaget's (1969) work revolved around examining a developmentally-based concept of intelligence. While it is reasonable to assert that certain hereditary factors condition intellectual development, he says "one can attribute intellectual progress to the pressures of the external environment whose characteristics would impress themselves little by little on the child's mind" (p. 357). Many modern-day psychologists believe "intelligence is the joint product of genetic and environmental variables" (Boodoo, Bouchard, Boykin, et al, 1996). Neurologists affirm the critical role of a child's experiences in postnatal development (Chugani, 1998; Nelson & Bloom,

1997). To resolve the argument of nature versus nurture, it is logical to assume music aptitude is an interaction of nature and nurture.

Neurologists have identified that music aptitude stabilizes at around age nine or ten, which is when brain cells have finished making connections related to each of our senses (Chugani, 1998; Gordon, 1998b). In these critical periods of optimal learning, the environment's power to remodel the brain goes to work (Chugani, 1998). Until approximately age nine or ten, aptitude is considered to be developmental; that is, it fluctuates depending on the quality of the environment (Bloom, 1964; Gembris, 2002; Gordon, 1998a).

For music, the same is true. Music psychologist and researcher, Edwin Gordon discovered developmental music aptitude. His extensive research with music aptitude has revealed that a child's music aptitude responds to musical environmental influences before age nine. He states, "Before music aptitude stabilizes at age nine it is ever changing, moving up and down as it develops in association with the child's environmental influences (2003b, p. 43)." At school and home, the environment can be one that will improve or hinder a child's potential to achieve in music. A child who participates in an appropriate formal or informal music environment that meets her needs is more likely to raise the level of her music aptitude than one who does not. Gordon (1998a) also discovered that a child's music aptitude is greatest at birth and then experiences a sudden drop. If quality environmental factors do not support a child's music aptitude, it will continue to decrease. An appropriate environment on the other hand can help raise a child's music aptitude level, back to birth level (Gordon, 1998a).

By providing optimal amounts and types of formal and informal music instruction

within this critical time span, a teacher can increase a child's aptitude, allowing that child to comprehend music faster and with greater ease throughout his or her life (Flohr, 1991; Gordon, 2003b; Taggart, 1997). When working with young children, what becomes of essence then is what teachers can do to raise a child's aptitude before it stabilizes. Of secondary importance becomes discovering effective instruction that increases the amount and quality of a child's music achievement.

There have been many studies that examine the effects of various types of instruction on developmental music aptitude (Atterbury and Silcox, 1993; Flohr, 1991; Guilbault, 2003; Gordon, 1980; Holohan, 1983; Jessup, 1984; Jordan-Decarbo, 1982; Lange, 2000; Levinowitz, 1987; Rutkowski, 1996; Taggart, 1997). Flohr (1981) investigated the effect of short-term music instruction on developmental aptitude and found developmental aptitude increases with instruction as opposed to no instruction, indicating that aptitude does not naturally grow without an influence from the environment. Gordon (1980) compared the developmental aptitudes of inner-city, disadvantaged students with students in the *Primary Measures of Music Audiation* standardization sample and found differences to be statistically significant at every grade level, signifying that environmental factors affect developmental aptitude. Taggart (1997) investigated whether appropriate instruction would affect aptitudes and whether the effect would continue after instruction ended. She found that aptitude scores increased with appropriate instruction and that they continued to increase even after instruction ended. In the same study, she compared the effect of instruction on student's aptitudes of varying ages and found that differences in developmental aptitudes as a result of environmental influences decrease with age; older students' aptitudes are not affected as much as those

of younger children by appropriate instruction.

Jessup (1984) studied the effect of direct and indirect teacher-behavior on developmental music aptitude and found that low aptitude students' scores increased significantly more than those of high aptitude students with both teaching styles. Atterbury & Silcox (1993) found no significant difference when considering the effect of piano accompaniment or no piano accompaniment on developmental music aptitude. Guilbault (2002) studied the effect of harmonic accompaniment on music aptitude and found no significant difference, possibly because students' aptitude scores in her study were so high to begin with that there was little room for growth. Rutkowski (1996) explored the effects of individual versus group instruction on developmental aptitude and found no significant tonal aptitude differences existed between groups, though both groups' tonal aptitude mean scores had gains. Levinowitz (1987) examined the effect of song instruction with words and song instruction without words on developmental aptitude and found no evidence to conclude either of the treatments to be superior. Lange (2000) also examined the effect of song text versus no song text on developmental aptitude and discovered that students who learned songs with no text tended towards greater gains in tonal aptitude than students who learned songs with text. Jordon-Decarbo (1982) and Holahan (1983) studied the effect of instruction that labels same and different patterns on a child's developmental music aptitude. Jordan-Decarbo (1982) found no difference between labeling and not labeling patterns. However, Holahan (1983) found that correct identification of different patterns on the *Primary Measures of Music Audiation* improved with treatment.

There has yet to be a study that investigates the effects of improvisation activities

on developmental music aptitude or singing achievement of students. Given that a child's musical aptitude is developmental, it is important to determine the best instruction for advancing a child's music aptitude. Since singing achievement is central to a child's musical growth, teachers need to know what types of instruction improve a child's ability to sing in tune. Therefore, the purpose of this research is to investigate the effects of improvisation activities in order to improve music instruction. The specific problems of this study are the following:

1) Will first grade students who receive improvisation instruction demonstrate different levels of tonal singing achievement than first grade students who receive no improvisation instruction?

2) Will first grade students who receive improvisation instruction demonstrate different levels of developmental aptitude than first grade students who receive no improvisation instruction?

CHAPTER TWO

RELATED RESEARCH

The focus of this study is to gain information about the effects of improvisation instruction on developmental aptitude and tonal singing achievement. Research most closely related to this study falls under one or several of the following headings: (a) studies that examine effects of various types of instruction on tonal singing achievement, (b) studies that examine effects of various types of instruction on developmental tonal aptitude and (c) studies that examine effects of improvisation activities on music achievement.

The Effect of Instruction on Singing Achievement

The effects of instruction on singing achievement have been the focus of numerous studies (Atterbury and Silcox, 1993; Guilbault, 2002; Levinowitz, 1987, 1989; Lange, 2000; Stauffer, 1985; and Rutkowski, 1996). Treatments, such as text verses no text, melodic context, varied harmonic accompaniment, and large group versus small group or solo singing formats, were administered to determine if any of those variables effected singing achievement.

Levinowitz (1987) investigated whether song instruction with words or without words would increase the singing achievement of kindergarten and first grade students (N = 35). Three experimental groups were used to determine effects of treatment: Group One received song instruction mostly with words; Group Two received song instruction

mostly without words; and Group Three received all song instruction with words. None of the treatments were found to be superior. Results may have been negatively influenced by the small number of subjects in the study (N=35).

In 1989, Levinowitz continued to study the effects of songs with and without words on children's singing ability. For five months, once a week for thirty minutes, four- and five-year- old children (N=35), received music instruction including movement, rhythm, and rote song instruction in which half of the songs were sung with words and the other half on a neutral syllable. In month five, subjects were taught one song with words and another with a neutral syllable; both songs had like melodic, rhythmic, and harmonic content. In controlling for order of songs when subjects performances were recorded, Levinowitz arranged for half of the students to sing the song with words first, followed by the song with a neutral syllable and the other half to sing the song with a neutral syllable first, followed by the song with words. Using a five-point rating scale, two judges rated the performances with a reliability of .78 and higher. When singing using a neutral syllable, students performed more accurately than when singing the song with words.

While Levinowitz looked at the effect of using text verses a neutral syllable on singing accuracy, this study examines the effect of improvisation instruction on ability to sing in tune. Also, the current study uses a much larger sample size and two months longer treatment time. Finally, students in the present study were given instruction twice a week for thirty minutes as opposed to once a week.

Lange (2000) also probed the effects of songs taught without text versus songs taught with text on singing achievement Kindergarten students (N = 58) were placed in

either the experimental group, which learned songs mostly without text, or the control group, which learned songs mostly with text. At the conclusion of 24 weeks of instruction, with two 30 minute classes per week, students were rated on their performance of two criterion songs by three independent judges using Lange's Tonal Accuracy scale. Results showed no significant difference in singing achievement between the text and no text group.

There are several differences between this study and that of Lange's study. In the Lange study, treatment involved text verses no text, whereas this study's treatment implements improvisation versus no improvisation instruction. Also, subjects in the present study had four weeks longer of treatment than did Lange's subjects. Finally, Lange's subjects were kindergarten students and this study's subjects are first grade students, who are more ready to improvise than kindergarten students.

Guilbault (2002) investigated the effect of harmonic accompaniment on the singing accuracy of kindergarten and first grade students (N=136). One of her problems was to determine the effect of hearing a root melody accompaniment on students' ability to sing in tune. The control group and experimental group each consisted of two kindergarten classes and two first grade classes. All students received instruction according to Gordon's Music Learning Theory involving singing, chanting, moving, playing instruments, identifying pattern function, and improvisation activities. The experimental group received song instruction with root melodies, whereas the control group received no root melodies. Treatment lasted twenty-five weeks with 30-minutes of formal music instruction twice every six-day instructional cycle. Two researcher-composed criterion songs were taught to all subjects four weeks prior to testing. At the

conclusion of treatment, students were tested on their ability to maintain keyality and tonality while singing the criterion songs. Three independent judges rated performances using a two dimension, five-point continuous rating scale written by the researcher.

There were no significant differences in singing achievement between students in the experimental and control groups. However, children in the experimental group tended to have higher ratings than those in the control group. Guilbault concluded results might have been significant if the treatment had been presented over a longer span of time and if individual class times were longer. She also noted that differences as a result of treatment may not be noticeable until later in a child's developmental stages.

Guilbault's (2002) study differs from the present one in that, in the current study, the ability to sing in tune is tested both pre- and post-treatment, instead of just post-treatment. This allows the comparison of gain scores for differences as a result of treatment. Also, whereas her study measured keyality and tonality, this study uses a single rating scale to measure ability to sing in tune. This study also addresses the difference between singing in tune and singing voice development, which Guilbault's did not. The Tonal Achievement rating scale provides a 1-rating for students who do not use their singing voice.

Stauffer (1985) studied the effects of melodic and harmonic contexts used during echo training on the singing skills of children in grades one, two and three (N = 310). Students were placed in one of four experimental groups receiving echo training in one of the following contexts: (a) no context, (b) melodic context, (c) harmonic context or (d) both melodic and harmonic contexts. Treatment lasted twelve weeks and included the use of melodic training tapes. Though differences did not reach statistical significance, post-

test mean scores were found to be higher than pre-test mean scores on a "Test of Singing Ability" for all treatment groups. The current study also utilizes harmonic and melodic context within the frame of the improvisation instruction and other activities in both the control and experimental groups as well, but only for first grade students.

The purpose of Atterbury and Silcox's (1993) study was to examine the effect of piano harmonic accompaniment on kindergarten student's ability to sing in tune. The experimental group (N = 96) received song instruction with no piano accompaniment, whereas the control group (N = 109) received song instruction with piano accompaniment. Treatment lasted for one year. Students were tested before and after treatment on their ability to sing a four-phrase, AABA song, and their performance was rated using a 4-point rating scale. Results indicated no significant difference between the scores of students who received piano accompaniment and those who did not. The researchers attributed this lack of statistical significance to a faulty rating scale. The present study addresses this problem by using a five-point rating scale used successfully in a previous research study. In contrast to Atterbury and Silcox's study, which used piano harmonic accompaniment, the present study utilizes vocal chord root accompaniments included in the improvisation treatment.

The purpose of Rutkowski's (1996) study was to compare the effectiveness of large group versus small-group/individual instruction on singing achievement. Ninety-nine kindergarten students served as subjects for this study (N = 99) and received treatment once a week for 30 minutes, over a period of nine months. All subjects learned the same repertoire from a music specialist, except that students assigned to the control group received instruction in a traditional large group format and students assigned to the

experimental group received instruction in a small-group/individual format. Students were pre- and post-tested for singing voice development using the Singing Voice Development Measure (SVDM), which was developed by the researcher.

Using SVDM, two independent, trained judges rated performances that were previously taped. Significant differences were found favoring the treatment group, suggesting that small-group/individual instruction improves singing voice development. Further, the control group mean decreased from pre-test to post-test, suggesting large group instruction may have been detrimental to singing voice development. While students in the present study could not be separated from their class for individual treatment, students were given the opportunity to sing in group and solo contexts.

A review of these studies indicates conflicting information about whether text or no text in song instruction is superior for improving singing achievement. Different learning conditions, songs with no context, melodic context, harmonic context or melodic and harmonic contexts all seem to have no significant effect on singing achievement, although lack of significance could be a result of research flaws. Root harmonic accompaniment in song instruction may result in increased singing achievement. Finally, small group and solo instruction significantly affects singing achievement.

These findings will be incorporated into the present study in the following ways. For both the experimental and control groups, care will be taken to incorporate songs with and without text, with and without harmonic accompaniment, and in both group and solo formats, so that these factors will be controlled for and differences in treatment will likely be attributed to improvisation instruction instead of extraneous factors.

The effect of improvisation on singing achievement has not been studied.

However, several researchers have focused on improvisation. One researcher examined the effect of improvisation on music reading achievement (Azzara, 1993) and another looked at the effect of harmonic accompaniment on the quality of improvisations (Guilbault, 2003). Since there are no studies that focus on the possible effect of improvisation instruction on singing achievement, this study is unique and needed.

The Effect of Instruction on Developmental Aptitude

Many researchers have devoted their efforts to learning about the effect of certain types of instruction on developmental tonal aptitude (Atterbury and Silcox, 1993; Flohr, 1991; Guilbault, 2003; Gordon, 1980; Holohan, 1983; Jessup, 1984; Jordan-Decarbo, 1982; Lange, 2000; Levinowitz, 1987; Rutkowski, 1996; Taggart, 1997). Some of the types of treatments examined for their effects on developmental aptitude include large group versus small-group/solo singing, indirect versus direct teacher behavior, and short-term versus long term instruction. Other treatments include labeling sets of tonal patterns as same or different versus no labeling, text versus no-text song instruction, and harmonic accompaniment song instruction versus no harmonic accompaniment. Other researchers examined the effects of variables such as high versus low socio-economic environments, age and time.

Holohan (1983) compared the effects of (a) labeling only same patterns, (b) labeling only different patterns, (c) labeling same and different patterns and (d) labeling no patterns on kindergartners' ability to correctly identify patterns as same or different on a valid music aptitude test. *Primary Measures of Music Audiation* (*PMMA*) was used as a pre-test and post-test measure to determine levels of developmental music aptitude. The

period of treatment lasted eight weeks, and all subjects received the same musical activities. Even with a short treatment, Holohan concluded that identification of different patterns on the *PMMA* improved with treatment.

In addition to studying the effect of text versus no text on singing achievement, Lange (2000) studied the difference in pre-test and post-test tonal developmental aptitude scores according to treatment. She found that low aptitude students who received either two of the treatments had greater gains in their aptitude test scores than students with high aptitude, possibly because of regression toward the mean. However, students who learned songs with no text tended toward greater gains in tonal aptitude than students who learned songs with text.

Gordon (1980) compared the effect of divergent environmental backgrounds on developmental music aptitudes. Children in an inner city school, grades kindergarten through three (N = 167) served as subjects and received music instruction twice a week throughout the school year. Students were tested pre- and post-treatment using *Primary Measures of Music Audiation.* The differences between the manual standardization group and the inner-city students for the tonal subtest were found to be statistically significant at every grade level. Inner-city students scored significantly and consistently lower at every grade level than the standardization group, probably because of differences in instruction and environment. Also tested were children who attended a community music school weekly. Though the community music school students' scores were not significantly higher than those of the standardization group, as a trend, community music school students scored higher with relationship to the standardization group on the *PMMA*. This provides support that aptitude is not entirely innate but is influenced by instruction, since

the amount and quality of instruction affected aptitude scores.

Taggart (1997) examined the effects of age and appropriate instruction on developmental aptitude as well as how aptitude is affected after a time of no instruction following a time period of instruction. For a full school year, children preschool through second grade who had minimal prior music instruction, received music instruction during the school day twice a week for twenty minutes. Instruction involved singing and chanting in a variety of tonalities and meters, continuous fluid and beat movement, and pattern instruction in major and minor tonalities and duple and triple meters. She measured the aptitudes of the preschool children using *Audie* prior to and after instruction. The aptitudes of the kindergarten through second grade students were measured using *Primary Measures of Music Audiation* prior to instruction, immediately after instruction and again after four months of no music instruction. All tonal aptitude scores, with the exception of preschool scores, significantly increased, controlling for maturation, after instruction and continued to significantly increase after four months of no instruction, suggesting that the effect of appropriate music instruction holds up over time. Further, the scores of younger students yielded more of difference after instruction than the scores of older students, signifying that the younger the student, the stronger effect instruction will have on developmental music aptitude.

Flohr (1981) investigated the effect of different types of short-term music instruction on developmental aptitude. Children with a mean age of five years old served as subjects in the study (N = 29). Through random assignment, students were placed in one of three groups: Music I Group received instruction that focused on improvisatory experiences on tone-bar instruments, incorporating things like question and answer

games, playing in response to verbal stimuli, and improvising phrase endings; Music II Group received instruction through singing, movement, games, and playing percussion instruments; and the control group received no music instruction. *PMMA* was used as a pre-test and post-test measure. Treatment lasted 12 weeks. Though no significant difference was found between Music I Group who received improvisatory-based activities and Music II Group who received instruction through singing, movement, games, and playing instruments, a significant difference was found between the control group who received no music instruction and Music I and II Groups. These results indicate that five-year-olds' developmental music aptitude increases with instruction.

Most closely related to the present study is Flohr's examination of instruction, including improvisation, and its effect on developmental music aptitude. Although, it is questionable whether the activities included as a part of his treatment were truly improvisational rather than creative or exploratory. An improvisation would need to have some restrictions, such as a pre-set tonal or metric context. Since tone-bar instruments were used as the performance medium, children may have mechanically manipulated the instrument by striking bars in visual patterns instead of audiating their intended responses prior to performing, which would be an indication of exploration rather than improvisation. The present study seeks to address this through the use of voice rather than instruments for improvisations.

Several researchers have found no significant changes in aptitude as a result of treatment (Atterbury & Silcox, 1993; Guilbault, 2002; Jessup, 1984; Lange, 2000; and Rutkowski, 1996). Atterbury & Silcox (1993) found no significant difference when considering the effect of piano accompaniment or no piano accompaniment on

developmental music aptitude, possibly because of the narrow range of the rating scale. Guilbault (2002) found no significant difference in developmental tonal aptitude scores of kindergarten and first grade students when examining the effect of root melody accompaniment, possibly because there was little to no room for aptitude score growth using IMMA as a criterion measure; scores were high to begin with. Jessup (1984) found that neither direct nor indirect teacher behavior is superior for increasing developmental aptitude scores, possibly because treatments were faulty, extra-musical, and not distinctive enough from one another; aptitude scores of both treatment groups increased, though not significantly. While Lange (2000) did not find a difference in developmental aptitude scores between treatments of songs taught with text and songs taught without text, students who learned songs without text tended towards greater gains in aptitude scores than students who learned songs with text. Rutkowski (1996) did not find a difference in tonal developmental aptitude scores between treatments of large group and small-group/individual singing. Perhaps with longer and more frequent treatment Lange (2000) and Rutkowski (1996) may have found a difference between treatments.

Several treatments have been shown to cause significant changes in developmental aptitude, including same and difference pattern labeling instruction and appropriate instruction in general (Flohr, 1981; Gordon, 1980; Holohan, 1983; Taggart, 1997). In Holohan's (1983) study, labeling pairs of patterns increased developmental aptitude scores. Taggart (1997) found aptitude scores continue to increase after a period of appropriate instruction, suggesting the effects of appropriate instruction upholds over time. Further, she found the effect of instruction on developmental aptitude is strongest with younger children. Flohr (1981) and Gordon (1980) also found that divergent

environments can positively or negatively effect developmental aptitude. It can be concluded that a child needs an appropriate music environment in order for that child's music aptitude to increase. Since there are few studies that have investigated improvisation as a treatment, this study seeks to examine whether vocal improvisation is an appropriate means for increasing a child's tonal developmental aptitude.

Effect of Improvisation on Achievement

To date, there are no studies that examine the effects of an audiation-based improvisation curriculum on singing achievement. However, Azzara (1993) studied the effects of improvisation activities on music reading achievement, providing support for improvisation instruction as a means of improving other areas of musical achievement, which is one of the problems of this study. Azzara (1993) examined the effects of an audiation-based improvisation curriculum on the music reading achievement of 66 fifth-grade instrumental students (N=66). Before treatment, students were rated for tonal, rhythmic, and expressive performance on three etudes by four judges who had previous experience using rating scales. The rating scales were designed by the researcher, and each criterion was defined for the judges. Interjudge reliability for the ratings of the three etudes was .90 and higher. Also before treatment, Azzara administered *Musical Aptitude Profile* (Gordon, 1995) to determine subjects' stabilized music aptitudes. Subjects were randomly assigned to either a control or experimental group, controlling for aptitude. Two different teachers from two schools, each taught a control and experimental group, based on a sound before symbol approach using *Jump Right In: The Instrumental Series.*

In addition to a weekly concert band experience, the control group received 30

additional minutes of instruction, including singing, movement, and tonal and rhythm pattern instruction. The experimental group also received the concert band experience and additional 30 minutes of instruction, but 10 to 15 of the 30 minutes of the additional instruction was devoted to improvisation instruction. This instruction included learning songs by ear, developing a tonal and rhythm pattern vocabulary using syllables, improvising with voice and on instruments in major tonality tonic, dominant and sub-dominant patterns, and improvising on the same mediums in duple meter macrobeat, microbeat, division, elongation and rest rhythm patterns.

After 27 weeks of treatment, students were asked to perform three etudes; the first etude was prepared by the student, the second was prepared with the help of a teacher, and the third was sight-read. Though his results were not statistically significant, Azzara found practical significance, because students who received improvisation instruction achieved a higher composite score on etude two and three than students who did not receive the specific improvisation instruction. These results indicate that instrumental performance from notation seems to be positively effected by improvisation instruction.

Azzara's study was conducted with fifth grade students, whose music aptitude had already stabilized. His study did not examine the effects of improvisation on developmental music aptitude. Azzara worked with older children whose aptitude had already stabilized, whereas this study uses first grade students whose aptitude is developmental. The present study also differs from his in that it focuses specifically on the effect of improvisation activities on singing intonation of rote songs, unlike his in which ability to read and perform written music was the dependent variable.

In light of the studies reviewed, it is clear there is a need for a study that

investigates the effect of vocal improvisation on students' ability to sing in tune. Also, since there are no studies that explore the effect of vocal improvisation on developmental aptitude, this study will attempt to fill several holes in the research literature.

CHAPTER THREE

METHODOLOGY

Subjects

Ninety-three first-grade students participated in this study (N=93). The students in this study were from six intact first grade classes, two from one elementary school and four from another elementary school in a suburban Michigan city. Class size ranged from 21 to 27 students per class. Three classes were assigned to the Experimental Group, and three classes were assigned to the Control Group. From the first school, one class was assigned to the control group and one was assigned to the experimental. From the second school, 2 classes were designated to the control group and two were designated to the experimental group. To make treatment groups as equal as possible, the *Primary Measures of Music Audiation* and Tonal Singing Achievement pre-test scores were used to control for aptitude and achievement. The researcher taught the classes at one school and a music education specialist with similar training and teaching style taught the students from the second school. Students came from an ethnically diverse, upper-middle class background. Their ages ranged from five to seven years old.

The district-wide music curriculum does not include improvisation. It includes eight concepts: "Singing Technique, Melody, Harmony, Rhythm, Form, Music Literacy, Texture and Expressive Elements," and outlines specific skills under each of these headings for first through fifth grades. Elementary music teachers decided that improvisation was implied and should be used only to develop the other skills, rather than

considering it as a skill in and of itself. At the school in which the study was conducted, the researcher, who is also the subjects' music teacher, has used activities that allowed for students to improvise rhythm patterns between song repetitions in duple and triple meter and create endings to songs. Little had been done with tonal improvisation beyond vocal exploration and creativity and instrumental timbral exploration.

Design

The design of this quasi-experimental study included an experimental group and a control group. The treatment for the experimental group was improvisation activities in major and minor tonalities within the context of repertoire. Students in the experimental group were given opportunities to improvise in group and solo contexts. Improvisation activities were taken from *Jump Right In: The General Music Curriculum,* as well as developed by the researcher. The control group received no improvisation activities, but rather movement, singing and tonal and rhythmic discrimination tasks in the context of the same repertoire. The design was one-dimensional, employing a Tonal Achievement Test with a five-point continuous rating scale and the aptitude test *Primary Measures of Music Audiation* (see Appendix A) to measure the dependent variables of singing achievement and developmental aptitude, respectively.

Criterion Measures

Two criterion measures, *Primary Measures of Music Audiation* (*PMMA*) (Gordon, 1979) and a researcher-designed Tonal Singing Achievement Rating Scale based on Taggart's scale (Taggart, 2001) were used for this study. Both criterion measures were given as pre-test and post-test measures to all subjects.

PMMA was used as a pre-test and post-test measure of students' developmental tonal aptitude. The *PMMA* Manual reports a composite split-halves reliability of .92 and a test-retest reliability of .75 for first grade students (Gordon, 1986). The *Tonal* subtest of *PMMA* includes 40 pairs of tonal patterns. The patterns are void of rhythm. They are played in major and minor tonalities in the keyality of C. Students are required to decide whether the two patterns in each of the 40 pairs are the same or different. Items are designated by pictures of objects, such as a book or car, on the answer sheet and are announced on the recording, to control for knowledge of numbers. A child hears the word "first" and then the first pattern, then "second" and the second pattern. If the student decides the two patterns are the same, she circles a box with two smiling faces. If the student decides the patterns are different, she circles the box with a smiling and frowning face. For this study, test administration followed the guidelines presented in the *PMMA* Manual. *PMMA* includes a rhythm subtest as well; however only tonal aptitude scores will be gathered for the purposes of this study.

The second criterion measure was a researcher-designed Tonal Singing Achievement Rating Scale, (see Appendix B) that is used to rate ability to sing in tune. It also was used as a pre-test and post-test measure. The Tonal Achievement rating scale is a five-point continuous scale based on Taggart's (2001) scale for use in rating ability to sing in tune. Criterion Song A, Wooly Lamb (major) and Criterion Song B, Rocket Ship (minor), written by the researcher were used for a pre-treatment tonal achievement rating. Guilbault's (2003) Criterion Song #1(major) and Criterion Song #2 (minor) were used to rate tonal achievement post-treatment (see Appendix C). They were chosen because they are appropriate for this study's specific group of children, and they have already been

used successfully in the research study by Guilbault (2003) with similar subjects. Criterion songs A and B (Appendix D) are comparable in difficulty to Criterion songs #1 and #2. They used the same chord progressions and incorporate similar kinds of rhythms and intervallic skips. Students were taught each criterion song by rote. After learning the songs, students were recorded singing individually without accompaniment in a room away from other students. Prior to performing each song, the student was given a preparatory sequence of tones (see Appendix E) to establish the tonality of each criterion song. Then they were given a "Ready sing," with "sing" being the same as the starting pitch of the criterion song. Students sang each song a capella.

The same process used for teaching Criterion Song A and B prior to treatment was used for Criterion Song #1 and #2 following treatment, except that the latter two songs were taught within the same time frame as the improvisation activities. Performances were recorded using a basic tape recorder with built-in microphone. Students' names were number coded to enable confidentiality. Two independent judges rated each performance for ability to sing in tune. Judges were trained by the researcher and had practice using the rating scale prior to evaluating student performances.

Procedures

Four first grade classes from the School A received treatment from a trained music educator, who was the students' regular music teacher; two classes were assigned to the control group and two classes were assigned to the experimental group. Two first grade classes from School B received treatment instead from the researcher who was the students' regular music teacher. To control for teacher effect, one class was assigned to the control group and the other was assigned to the experimental group. Approximately

one-third of the first grade students, equally distributed between the experimental and control groups, received music instruction in full-day kindergarten the previous year from the researcher, and two-thirds of the first grade students received minimal or no music instruction from their regular classroom teacher in half-day kindergarten. Procedures adhered to the research study calendar (Appendix F). Before receiving improvisation instruction, all students were rated on their ability to sing Criterion Song A , Wooly Lamb, in major and Criterion Song B, Rocket Ship, in minor in tune. They also took *PMMA,* to determine their aptitude scores prior to treatment. Classes were assigned to the experimental or control groups, controlling for differences in aptitude and achievement.

All students received formal music instruction twice a week for 30 minutes over a time-span of 28 weeks. The music curriculum was based on Gordon's Music Learning Theory, in which students learn by ear before they learn to read music, and incorporated Laban movement (Appendix G). The first five to six minutes of class were used for movement/vocal warm-up and tonal or rhythm pattern instruction. Patterns were taught informally, as well as formally using the Tonal and Rhythm Register books from Learning Sequence Activities (Gordon & Woods, 1990). The remaining time, students were engaged in other activities, such as singing, chanting, fluid and beat moving and playing instruments. For the experimental group, five to seven minutes of this activity time was spent on vocal improvisation instruction within those contexts. For the purposes of this study, improvisation was not limited to jazz, but rather included improvisations on American folk music. Activities included predicting patterns within a harmonic context, improvising different tonic and dominant patterns between song repetitions, improvising introductions and codas to songs using tonic and dominant function patterns, improvising

a melody over chord roots for the second half of a familiar song and changing song endings within a set harmonic function. Students in the control group and experimental groups learned the same repertoire. However, those in the control group engaged in the repertoire through activities other than improvisation, like echoing patterns (see Appendix H). The experimental group engaged in vocal improvisation activities for five to seven minutes in the context of repertoire and included the following: a) improvising stepwise, tonic and dominant patterns with solfegé syllables in major and harmonic minor tonalities; and b) improvising melodic patterns in major/duple, major/ triple, minor/duple and minor/triple. All improvisations were vocal. The treatments were structured so that improvisations that required greater skill increased as time progressed.

After 28 weeks of instruction, all students were re-tested using *PMMA* to determine how aptitude was affected by the improvisation treatment. In addition, all students performed Criterion Song #1 and #2 and the same Tonal Achievement Rating Scale was used to rate tonal accuracy to determine how singing achievement was affected by the improvisation instruction treatment.

CHAPTER FOUR

RESULTS

The purpose of this research was to investigate the effects of improvisation instruction on tonal singing achievement and developmental tonal aptitude of first grade students. Data were gathered and evaluated using the following statistics: a) pre-test tonal singing achievement means and standard deviations for the major and minor songs for the experimental and control groups, b) t-test to look for significant differences between the pre-test tonal singing achievement scores of both treatment groups, c) inter-judge reliabilities for the tonal singing achievement rating scale for both songs, d) post-test tonal singing achievement means and standard deviations for the major and minor songs for the experimental and control groups, e) t-test to search for significant differences between the post-test tonal singing achievement scores for both groups, e) pre-test *Primary Measures of Music Audiation (PMMA)* tonal sub-test means and standard deviations g) t-test to look for significant differences between the pre-test *PMMA* scores of the control and experimental groups, h) corrected split-halves reliabilities for the *PMMA* pre- and post-tests, i) post-test *Primary Measures of Music Audiation (PMMA)* tonal sub-test means and standard deviations, and j) t-test to search for significant differences between the post-test *PMMA* scores of the control and experimental groups.

Tonal Singing Achievement Pre-Test Results

The mean scores and standard deviations were determined for the two groups on the major and minor pre-test tonal singing achievement measure. The results are shown in

Table 1a. The no-improvisation control group's mean for the major tonal singing achievement pre-test was 5.51, and the standard deviation was 1.99. The improvisation-instruction experimental group's mean for the major tonal singing achievement pre-test was 5.88, and the standard deviation was 2.00. The no-improvisation group's mean for the minor tonal singing achievement pre-test was 5.33, and the standard deviation was 2.01. The improvisation group's mean for the minor tonal singing achievement pre-test was 5.74, and the standard deviation was 2.02. The no-improvisation composite mean was 10.84 and composite standard deviation was 3.71. The improvisation instruction composite mean was 11.64, and the composite standard deviation was 3.89. For the major and minor tonal singing achievement pre-test measure, the trend of the mean scores leaned in favor of the improvisation group.

Table 1a

Means and Standard Deviations for Tonal Singing Achievement Pre-Test

	Major		Minor	
Groups	M	*SD*	M	SD
Improvisation[a]	5.88	2.00	5.74	2.02
Control[b]	5.51	1.99	5.33	2.01

[a]$n = 50$. [b]$n = 43$.

Table 1b

Composite Means and Standard Deviations for Tonal Singing Achievement Pre-Test

	Composite	
Groups	M	SD
Improvisation[a]	11.64	3.89
Control[b]	10.84	3.71

[a]$n = 50$. [b]$n = 43$.

There was no significant difference in pre-test scores according to the treatment groups for tonal singing achievement of either major or minor songs or the composite. These results are reported in Table 2.

Table 2

T-Test Results for Tonal Singing Achievement Pre-Test

	MD	DF	t	p
Major	.368	91	.908	.3661
Minor	.414	91	.989	.3251
Composite	.803	91	1.014	.3134

Interjudge Reliability Results

Interjudge reliabilities between the two independent judges were calculated for the tonal achievement rating scale using a Pearson Product Moment correlation. For the pre-test tonal achievement rating scale, reliability for the major song (Wooly Lamb) was .82 and was .80 for the minor song (Rocket Ship). For the same tonal achievement rating scale used as a post-test measure, reliability for the major song (Move With Me) was .79 and was .81 for the minor song (Shining Star). These reliabilities represent a satisfactory level of interjudge agreement. As a result, the two judges scores were combined for the remaining statistical analysis.

Tonal Singing Achievement Post-Test Results

Table 3a and 3b shows the mean scores and standard deviations for the two groups on the major and minor post-test tonal singing achievement measure. The no-improvisation group's mean for the major tonal singing achievement post-test was 6.40, and the standard deviation was 2.11. The improvisation group's mean for the major tonal

singing achievement post-test was 6.66, and the standard deviation was 1.90. The no-improvisation group's mean for the minor tonal singing achievement post-test was 6.61, and the standard deviation was 2.32. The improvisation group's mean for the minor tonal singing achievement post-test was 6.92, and the standard deviation was 2.06. The trend of the mean scores tended to prefer the improvisation group for the major and minor tonal singing achievement post-test measure, as was true in the pre-test scores. The post-test scores on both songs tended to be higher than the pre-test rating for both groups.

Table 3a

Means and Standard Deviations for Tonal Singing Achievement Post-Test

	Major		Minor	
	M	SD	M	SD
Improvisation[a]	6.66	1.90	6.92	2.06
Control[b]	6.40	2.11	6.61	2.32

Table 3b

Composite Means and Standard Deviations for Singing Achievement Post-Test

	Composite	
	M	SD
Improvisation[a]	13.58	3.79
Control[b]	12.77	4.16

[a] $n = 50$. [b] $n = 43$.

Tonal Singing Achievement T-Test Results

A two-tailed t-test was used to determine if there were any significant differences between the two groups on scores for the tonal singing achievement rating scale. The

ratings for the major and minor tonal singing achievement tests were analyzed. The results are detailed in Table 4. This result is not statistically significant ($p < .05$). It cannot be concluded on the basis of this data that improvisation instruction will have a significantly greater effect on the tonal singing achievement of first grade students.

Table 4

T-Test Results for Tonal Singing Achievement Post-Test

	MD	DF	t	p
Major	.265	91	.637	.5259
Minor	.315	91	.694	.4892
Composite	.813	91	.989	.3266

PMMA Pre-Test Results

The tonal sub-test of *PMMA* was administered to all participants before treatment began. The *PMMA* pre-test scores were analyzed to determine whether the developmental tonal aptitude levels for each group were comparable. Means and standard deviations for each treatment group are shown in Table 5. For the no-improvisation-instruction control group, the mean of the *PMMA* tonal pre-test scores was 29.55, and the standard deviation was 7.44. For the improvisation-instruction experimental group, the mean of the *PMMA* tonal pre-test score was 29.88, and the standard deviation was 6.61. The results of a two-tailed t-test shown in Table 6, indicate that there were no significant tonal aptitude differences between the two groups before treatment.

Table 5

Means and Standard Deviations for PMMA Pre-Test

	M	SD
Improvisation[a]	29.88	6.61
Control[b]	29.55	7.44

[a]$n = 50$. [b]$n = 43$.

Table 6

T-Test Results for PMMA Pre-Test

	MD	DF	t	p
PMMA Pre-Test	.345	91	.237	.813

*$p > .05$.

PMMA Reliability Results

PMMA pre- and post-test split-halves reliabilities were computed and corrected using the Spearman-Brown Prophecy Formula. The pre-test reliability was found to be .71 and the post-test reliability was found to be .70. These are acceptable, but moderate reliabilities and are comparable to those reported in the test manual.

PMMA Post-Test Results

Table 7 shows the mean and standard deviation scores of the control and experimental groups for the *PMMA* post-test. For the no-improvisation-instruction control group, the mean of the *PMMA* tonal post-test scores was 34.07, and the standard deviation was 3.49. For the improvisation-instruction experimental group, the mean of the *PMMA* tonal post-test scores was 34.44, and the standard deviation was 3.44. These

means are higher than the pre-test scores for both groups. These numbers are similar.

Table 7

Means and Standard Deviations for PMMA Post-Test

	M	SD
Improvisation[a]	34.44	3.44
Control[b]	34.07	3.49

[a]$n = 50$. [b]$n = 43$.

PMMA T-Test Results

Two-tailed t-tests were used to determine if any significant differences were present between the two groups on scores for the *PMMA* post-test. The results are reported in Table 8. None of the results are significantly different ($p > .05$). In this study, improvisation instruction and no improvisation instruction with first grade student's yielded gains in tonal aptitude as measured by *PMMA* that were statistically the same.

Table 8

T-Test Results for PMMA Post-Test

	MD	DF	t	p
PMMA Post-test	.370	91	.514	.608

*$p > .05$.

Interpretation of Results

The results given above show no significant differences between the two treatment groups for any of the criterion measures in the study. It cannot be concluded on the basis of these results that improvisation or no-improvisation instruction, when applied

over a 28 week period, has a greater effect on gains in developmental tonal aptitude. This study also does not provide support that either instructional method is preferable for improving first grade student's ability to sing in tune. However, an interpretation of these results should take into account several factors that may have contributed to this outcome.

It is possible that the nature of the improvisation tasks were so novel to first grade students that they did not have adequate readiness to perform the tasks required. Two-thirds of the students were in their first year of music instruction, so the teachers were new to the majority of the students and many did not have any experience with appropriate music instruction prior to the research study. Typical improvisation readiness involves substantial time singing songs with and without words in a variety of tonalities and meters, moving, singing neutral syllable patterns in a tonal context, engaging in vocal exploration, and vocal creativity. According to both teachers' regular sequence of instruction, students would normally have one year of this type of learning before being asked to improvise. In this research study, students had to learn new tonal patterns immediately with tonal syllables whereas, in an ideal situation, students would have a full year of prior experience singing tonal patterns on neutral syllables before using tonal syllables. It was assumed that, if students were given tonal syllables, improvisation activities could be more structured and be more like improvisation activities than creativity activities, because using tonal syllables required students to understand which tonal function to use in activities. Prematurely advancing students to the use of tonal syllables in order to make improvisation activities more structured and clear, may have contributed negatively to the results. Less than 10% of students could perform the improvisation tasks appropriate to the context of the songs. Student tonal pattern

improvisations were often incorrect in that the sounds were associated with the wrong tonal syllables. If more students had the tonal readiness to complete the improvisation tasks, then perhaps the results might have been different, because the students would have improvised more successfully.

Perhaps other compromises in the improvisation instruction caused results to be inconclusive. After the majority of students unsuccessfully attempted to improvise patterns in major using Do-Mi-So and in minor using La-Do-Mi, the teachers simplified the task by asking students to omit the third scale degree and improvise patterns using just Do and So and La and Mi in the context of songs in those tonalities. This adjustment may have moved tasks farther away from being true improvisation tasks as previously defined, since removing the third scale degree made the tonality and pattern function less distinguishable. Another improvisation task required students to change the ending of songs while the teacher sang chord roots underneath. Though the teacher gave examples class periods prior to the task, it still may not have been sufficient for the students because there were only three to five students in each class who could accomplish the task successfully. Perhaps if more students would have been successful with the improvisation tasks, the results would have been different.

Perhaps the length of treatment was not ample enough to affect the results. Seven minutes of improvisation per class time over a 28-week period adds up to 392 minutes or approximately 6.5 hours of total improvisation instruction. In addition, the improvisation group did not receive the same instruction plus seven minutes of improvisation instruction. They received seven minutes of improvisation instruction instead of another activity that the no-improvisation group was receiving. So, the difference between the

two groups was not simply improvisation or no-improvisation. It, perhaps, would have been a more ideal research situation had the experimental group received the exact same instruction as the control group, with an additional 7 minutes of improvisation instruction. But, this would not accurately reflect the reality of the music classroom as teachers have to make choices within a set length of a class period.

The singing achievement results may have been affected by the vocal range of the songs and the fact that the songs students were assessed on all had words. During testing, some students forgot the words and stopped singing. When they re-started the song, it was clear most attention was given to the words rather than the sounds themselves, because the intonation was often worse when they began a second time. Two-weeks were given for teaching the criterion songs, but this may not have been enough time. Perhaps with three weeks to learn the songs, students would have performed the songs with greater accuracy and in a manner more reflective of their true abilities, though the observed mean was higher than the theoretical mean. The post-test criterion songs were written in a wider range than the pre-test criterion songs making the post-test songs more physically difficult to sing as students were required to sing over the vocal break. The pre-test song ranges were C#-B1 and the post-test song ranges were C#1-D1. Perhaps if song range would have been controlled the results would have been different.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Music educators, professors, researchers and associations have articulated clearly the need for improvisation to become an essential piece of children's musical education from the earliest stages of the educational process. Music improvisation cultivates independent musicianship and requires students to make inferences that involve higher level thinking skills, revealing what musical material they truly own. Improvisation has been shown to improve music reading skills. Because there is minimal research examining the effects of improvisation on parts of a children's musical growth, it is clear that far more research is necessary to determine how improvisation relates to the development of musical skills.

The purpose of this research was to investigate the effects of improvisation instruction in order to improve music instruction. Two specific research problems were the focus of this study. First, would there be any significant differences between students who received improvisation instruction and those who did not in their abilities to perform songs with tonal accuracy. Second, would there be any significant differences in the developmental tonal aptitude of first grade students who receive improvisation instruction versus those who receive no improvisation instruction.

The current study used an experimental design. Ninety-three first grade students from two public elementary schools in the same school district of a suburban Michigan city participated in the study. Six intact first grade classes were divided into two groups,

the no-improvisation control group and the improvisation-instruction experimental group. The researcher taught two classes; one was assigned to the control group and another to the experimental group. Another teacher taught four classes; two were assigned to the control group and the others to the experimental group. Subjects met for two half-hour time periods per week, for a total of 28 weeks. For two weeks prior to treatment, in addition to other music instruction, students learned a song in major and a song in minor, and their performances were assessed using a five-point continuous Tonal Singing Achievement Rating Scale by two independent judges. Additionally, before treatment began, the tonal sub-test of the Primary Measures of Music Audiation (*PMMA*) (Gordon, 1986a) was administered to all participants.

Students in the experimental group were given seven minutes each class period to improvise in group and solo contexts with patterns in major and minor tonalities, as well as to change song endings while chords roots were sung by the teacher. For the remainder of the time, students in the control group received identical instruction to the control group. This instruction included which involved movement, singing, chanting, and playing instruments. The control group received no improvisation activities, but rather movement, singing, chanting and playing instruments in context of the same repertoire that the experimental group used for improvisation activities.

Following the treatment, two criterion measures were used to determine the effects of the improvisation treatment. The tonal sub-test of the *PMMA* was administered as a post-test to the measure the developmental tonal aptitude gains. Over the course of two weeks students were taught two new songs in major and minor and were tape-recorded singing those songs individually in a separate room. These performances were

rated by two independent judges on the same Tonal Singing Achievement Rating Scale that was used as a pre-test measure. The Singing Achievement Rating Scale was based on Taggart's scale (Taggart, 2001).

The judges' ratings on the pre- and post-test Singing Achievement measure were analyzed for interjudge reliabilities. Means and standard deviations were calculated for the pre- and post- Singing Achievement ratings. Means and standard deviations were also calculated for the pre- and post-test *PMMA* scores. T-tests were used to determine if significant differences existed between the treatment groups developmental tonal aptitude or for tonal singing achievement.

Results

No significant differences were found between the two treatment groups. It cannot be concluded based on the results of this study that having improvisation instruction is more effective than not having improvisation instruction in developing tonal singing achievement. It also cannot be determined from the results of this study that improvisation will produce greater growth in tonal developmental aptitude.

Conclusions

No significant differences were found between the experimental and control groups for any of the problems of this study. Based on the results on this study, improvisation instruction as compared to no improvisation instruction did not result in higher tonal developmental aptitude scores or tonal singing achievement. However, the results of the tonal aptitude testing may affirm the concept of developmental music aptitude, since both groups showed positive gains in *PMMA* test scores after 28 weeks of regular instruction.

There is no evidence to indicate improvisation or no improvisation instruction will produce a greater ability to sing in tune. However, it should be observed that the inclusion of improvisation instruction in the music curriculum, with a consequent decrease in the amount of other music activities, did not significantly hinder the development of tonal singing achievement and tonal aptitude. It is possible that the benefits of the improvisation instruction were not measured in the dependent variables of this study or will unfold in future years of the children's development. Given that improvisation instruction does not appear to be a detriment to tonal singing achievement or aptitude development, teachers should consider including improvisation activities in their first grade music classes until more research is conducted on its effects.

Recommendations for Future Research

Due to the limitations of this study and the absence of significant results, it is clear that future research in this area is needed. Following are recommendations:

After observing the difficulty first grade students had with some of the improvisation tasks, the researcher recommends that the study be repeated with students who have a full year of aural/oral experience engaging in music in a variety of tonalities and meters, singing, chanting, moving, teacher demonstration of improvisation, and experience with simple vocal exploration and creativity tasks to provide the necessary foundation and readiness for more meaningful improvisation experiences to occur. This could be achieved by using first grade students who had better music preparation in kindergarten or by using older students. Perhaps with the proper preparation, the benefits of improvisation instruction would be more fully realized.

This study should be replicated with three weeks as opposed to two weeks for the students to learn the criterion songs prior to testing in order to generate results more reflective of each student's ability. This is necessary, especially short amounts of time are delegated to learning each song twice a week. Also, the criterion songs should use the same range of pitches for the pre- and post-tests.

Future studies investigating the effects of improvisation instruction on singing achievement should be conducted for a longer period of time. It is probable that differences in aptitude and tonal singing achievement could be present after an extended treatment period. A longitudinal study examining the tonal ability of older elementary school children who received improvisation instruction in earlier grades would be particularly valuable.

After experiencing first grade student attitudes toward being given the opportunity to create their own musical ideas through improvisation, the researcher is led to question whether the specific criterion measures employed in this study addressed the true value of improvisation instruction. Although student responses were often inaccurate in terms of associating sounds with solfège labels, students demonstrated considerable motivation towards having the chance to express their own ideas musically. They enjoyed improvising, even though their improvisation products were not particularly strong. It is possible that other aspects of musicianship besides singing achievement and tonal aptitude are positively affected by improvisation instruction. The research was intrigued that students in the improvisation group who lost their place when singing the post-test criterion songs improvised successful original endings which ended on the resting tone and were contextually appropriate and no students in the no improvisation group

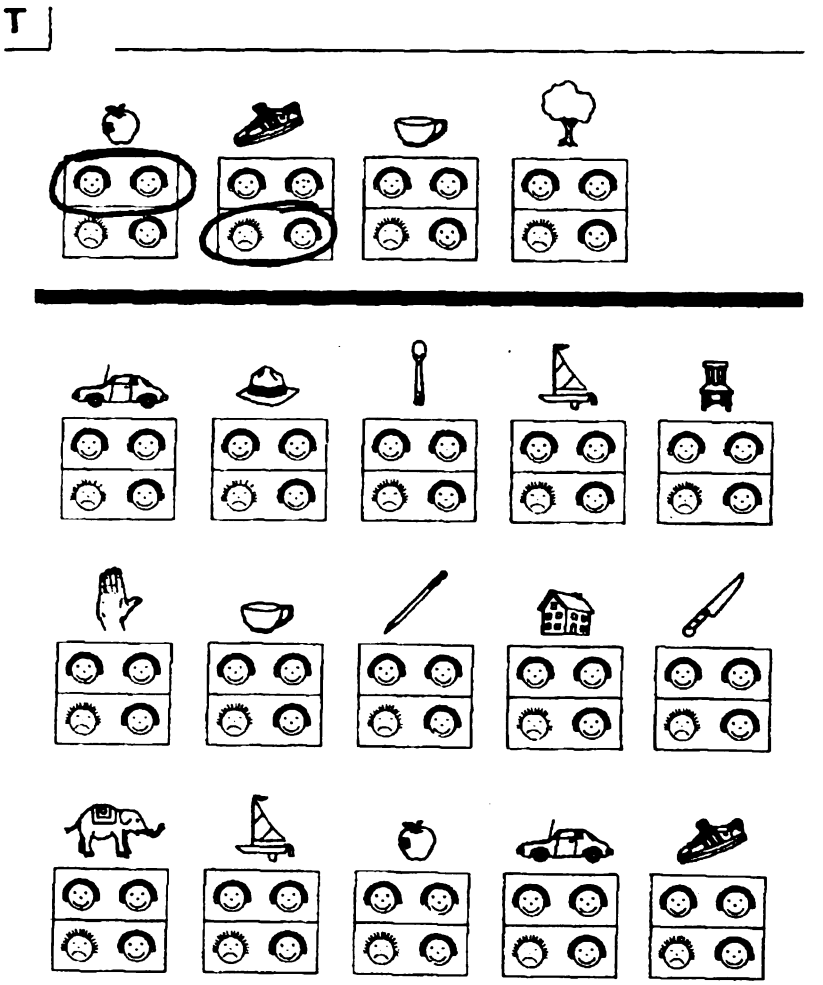
demonstrated this ability. Future research should investigate other areas of musical skill, such as rhythmic developmental, reading skills, writing skills, composing skills, arranging skills, investment in the music learning process and attitudes towards music.

There is no support for improvisation instruction producing a greater ability to sing in tune. However, including improvisation instruction in the music curriculum, with a consequent decrease in the amount of other music activities, does not significantly hinder the development of tonal singing achievement and tonal aptitude. It may be that the benefits of the improvisation instruction were not measured in the dependent variables of this study or could become known in future years of the children's development. Since improvisation instruction does not seem to be detrimental for tonal singing achievement or aptitude development, teachers should consider including improvisation activities in their first grade music classes until more research is carried out on its effects.

APPENDICES

APPENDIX A

Tonal subtest of *Intermediate Measures of Music Audiation* Test Form



APPENDIX B

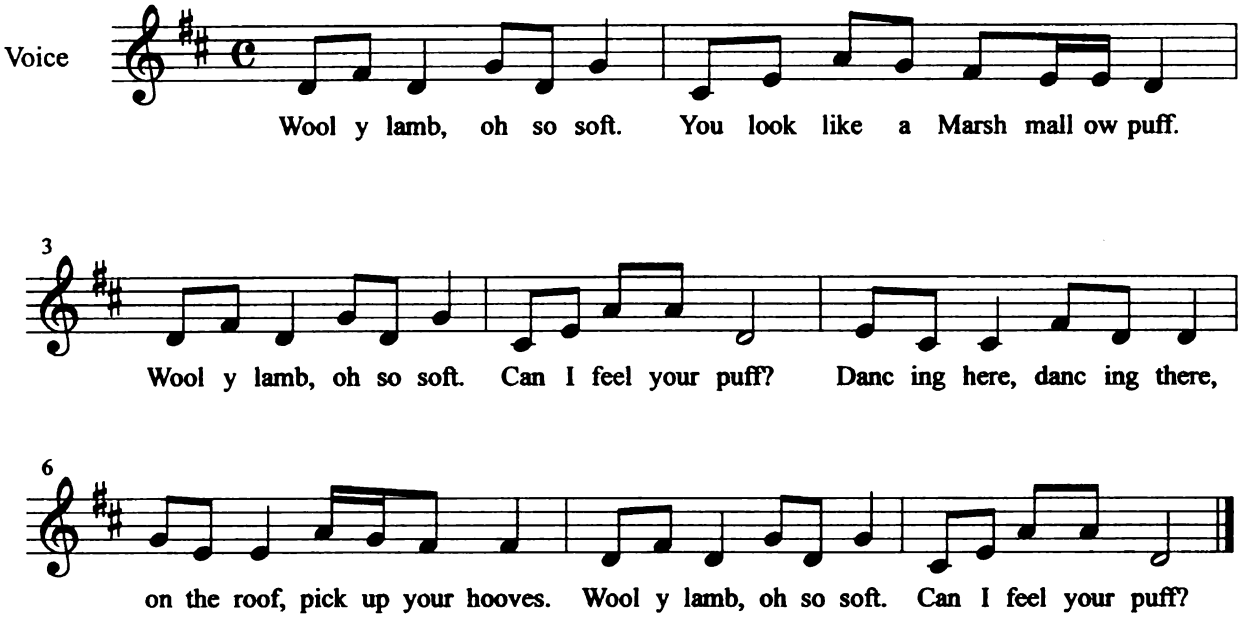
Tonal Singing Achievement Rating Scale

1. The child performs in their speaking voice or in a monotone voice.
2. The child sings the song on the wrong pitch level.
3. The child sings part of the song on the correct pitch level, but is unable to maintain it for all of the song.
4. The child sings most of the song in tune, with minimal errors in pitch and intonation
5. The child sings the entire song with accurate pitches and intonation.

APPENDIX C

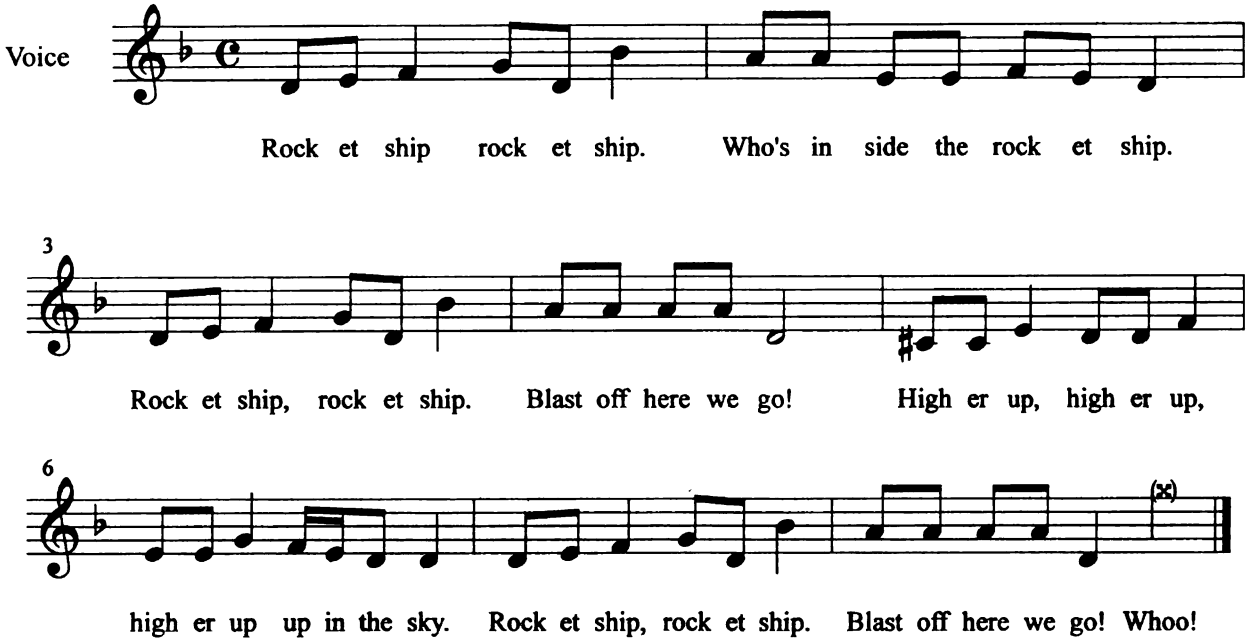
Criterion Song A
Wooly Lamb

Emily Jambeau



Criterion Song B
Rocket Ship

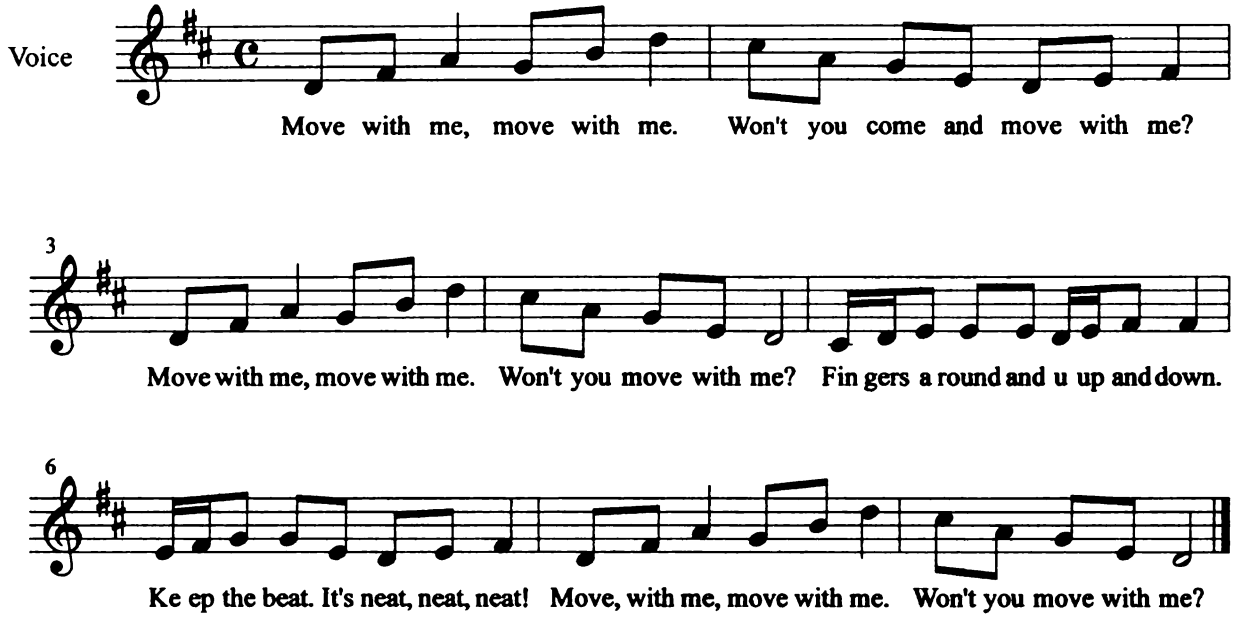
Emily Jambeau



APPENDIX D

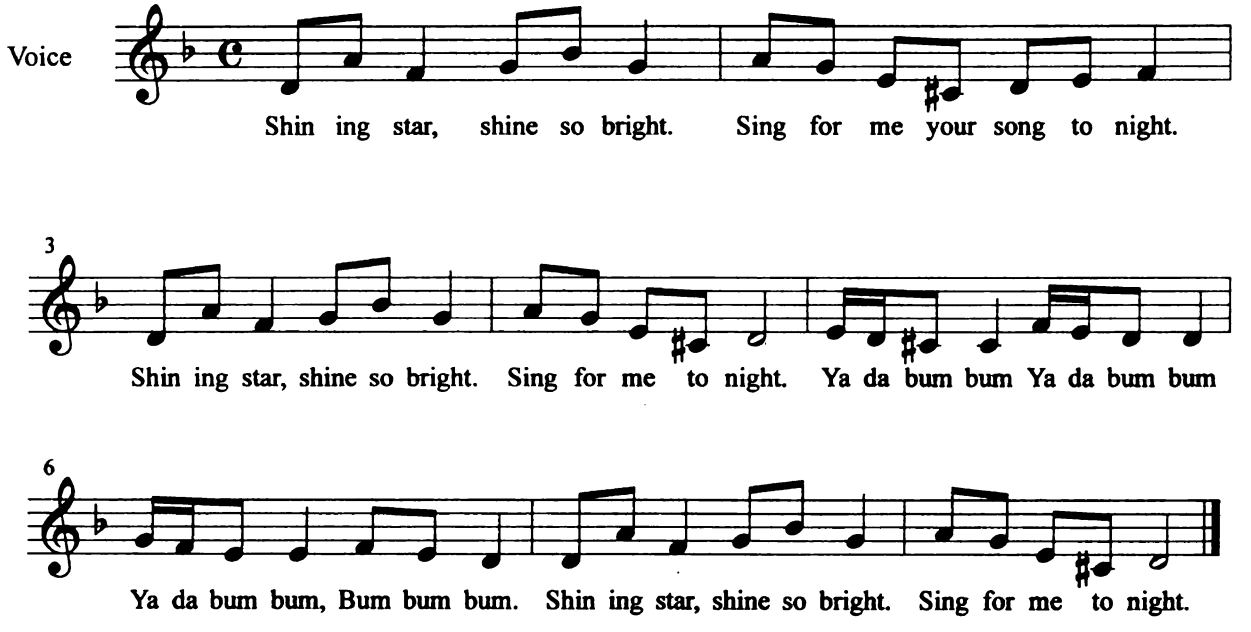
Criterion Song #1
Move With Me

Music by Denise Guilbault
Text by Emily Jambeau



Criterion Song #2
Shining Star

Music by Denise Guilbault
Text by Emily Jambeau



APPENDIX E

Preparatory Sequence
Major Tonality

Preparatory Sequence
Minor Tonality

APPENDIX F

Research Study Calendar

Sept. 1	First full day of school
Sept. 2-5	Labor day weekend-no school
Sept. 6-13	Consent forms home/ Teach Criterion Songs A and B5
Sept. 12-16	Administer *PMMA* Tonal Subtest (first class period)
Sept. 14	Consent forms due
Sept. 19-23	Tonal Singing Achievement Pre-test / Improvisation readiness-pattern echoing/discrimination
	Scoring, rating, data analysis, groups assigned
Sept. 26	Treatment begins
Dec. 22-Jan. 2	Winter break
Feb. 20-24	Mid-winter break
April 14-18	Spring break
May 1-5	Being teaching Criterion Songs #1 and #2
May 15-26	Administer *PMMA* Tonal Subtest (first class period) and Tonal Singing Achievement Post-tests (second class period)
	Scoring, rating and data analysis

APPENDIX G

Three Stage Approach to Learning

Stage 1	**Stage 2**		**Stage 3**
Whole	**Part**		**Whole**
Experience the Whole	Study the Parts		Understand and Comprehend the Whole
CLASSROOM ACTIVITIES	**LEARNING SEQUENCE ACTIVITIES**		**CLASSROOM ACTIVITIES**
Singing	**Discrimination**	**Inference**	Singing
Chanting	Aural/Oral	Generalization Aural/Oral	Chanting
Moving and Dancing	Verbal Association	Generalization Verbal	Moving and Dancing
Playing Instruments	Partial Synthesis	Creativity/Improvisation	Playing Instruments
Playing Games	Symbolic Association	Generalization Symbolic	Playing Games
Creating and Improvising	Composite Synthesis	Theoretical Understanding	Creating and Improvising
Reading and Writing Music			Reading and Writing Music
Performing			Performing

(Taggart, C., Bolton, B., Reynold, A., Valerio, W. & Gordon, E., 1999)

APPENDIX H

Sample Lesson Plan

Hello Song and Warm-Up (Spoonful of Sugar, Harry Connick Jr.): Students move with continuous fluid movement and beat across horizontal and vertical planes and through different levels of space.

Look at Me (Minor/Duple) Between song repetitions students respond in group and solo singing to patterns in the context of duple, triple, major and minor given by teacher. Song changes weekly and rhythm and tonal patterns are alternated weekly. This week focused on minor tonal patterns.

Control- Echo pattern exactly

Experimental: Improvise 3-note minor tonic pattern using La-Do-Mi while audiating resting tone. This group also received opportunity to echo patterns as well to give them ideas to draw from when improvising.

Tideo (Major/Duple): Students connect hands, creating windows while one student skips around the circle going under a window on "jingling, jingling". The student skipped around sings.

Control: Echo teacher patterns

Experimental: Improvise a 3-note major tonic pattern using Do-Mi-So. Teacher sings dominant So-Fa-Re-Ti patterns in between tonic ideas.

Lydian Leapfrog (Lydian/Unusual Unpaired): Students take preparatory breath to jump on the downbeat. Teacher gives a "Ready-Breathe-Here" cue and students swing arms in air with their breath coordinated so they land and say "jump." When they land, students flick macrobeats while moving continuously and fluidly. Each time, more students join in onto the straight line with the goal of landing the jump at the same time on the line in front of them.

London Bridge (Major/Duple): Students sing through melody on a neutral syllable. Students sing through the chord roots using Do and So for tonic and dominant changes. Teacher sings melody and students sing chord roots. Students sing chord roots and teacher sings melody.

Control: Students take turns singing the melody in solo while teacher sings chord roots. Vary with half of group singing chord roots and half singing the melody.

Experimental: Teacher sings chord roots while class sings first phrase and one student improvises a different second phrase. This is after teacher has demonstrated multiple improvisations the week before.

R.T. Frog (Phrygian/Duple): Teacher sings the song stopping at different points to toss a leap frog onto the floor into an individual student's hand to sing the resting tone when it lands. If teacher tosses it up and catches it students should audiate the resting tone.

Donkeys Love Carrots (Major, Duple): Students play macrobeat then microbeat parallel bordun as an ostinato using D and A to accompany their singing.

Pony Bill (Minor/Triple): In self space, students rock forward/back to the macrobeat while one student gallops to "Du Di Du Di" in their feet. Student selected from where galloper stops sings pattern. Add multiple gallopers moving simultaneously.

Control: Galloper echoes a pattern from T then person who they stopped at echoes a pattern from T, then the class echoes a pattern.

Experimental: Galloper improvises a 3-note minor tonic pattern using La-Do-Mi, selected student improvises next and finally teacher improvises a different pattern interjecting dominant Mi-Re-Ti-Si patterns to keep context.

Move and Freeze (Hoedown, Aaron Copland): Students are acculturated to different styles of music with varying meters, tonalities, tempos, and dynamics of different cultures and different time periods.

Goldfish (Dorian/Triple): Cool down together. Mimicking gentle waves, kneeling students move a large canopy scarf while singing. At the end of the song the teacher gives felt ocean creatures out to several students singing a pattern to each student and student echoes.

Goodbye song (Major, Duple): All students sing or one leads in call and response form- "Let's sing goodbye together" with the class responding "Goodbye, goodbye, goodbye."

APPENDIX I

Letter of Consent

Dear Parents,

I am writing to ask permission for your child to participate in a research study which is in fulfillment of my degree of Master of Music Education at Michigan State University. The purpose of this research is to gather information about the effects of music improvisation instruction on the singing achievement and music aptitude of first grade students. I want to find out if music improvisation instruction increases a child's developmental tonal music aptitude and ability to sing in tune.

This study is being conducted using the three existing first grade music classes and will be performed by Emily Jambeau, the students' regular music teacher. The Tonal subtest of the Primary Measures of Music Audiation (PMMA) will be administered to students as a pre-test and post-test. PMMA is a developmental music aptitude test designed for grades K-3. I use it regularly in my first grade music classes. In the Tonal subtest, the children are asked to listen (for approximately 12 minutes) to forty pairs of patterns to determine whether they sound the same or different. I will also be recording students' individual voices on an audio CD-recording system singing a few short songs. Following the study, two qualified, independent judges will determine whether the improvisation instruction had any effect on student performances of the song. Following the study, all data will be stored at home in a locked cabinet in hard copy and on disk for five years following the study. Five years after the completion of the study, all data will be destroyed.

One class will serve as the treatment group and receive improvisation activities during music class. One class will serve as the control group. The third class will receive the same activities as the treatment group. All groups will learn the same music. The control group will be tested on the song, but not receive improvisation instruction during music class. Please know that your child will continue to receive the same excellent instruction in both the treatment and control groups and will continue to grow musically.

Your child's privacy will be protected to the maximum extent allowable by law. All aspects of your child's performance will be kept confidential and his or her name will not appear in any report of results. Within these restrictions, when the study is completed, the overall results of it will be made available to you upon written request. Participation is entirely voluntary, and students will be at no risk. Your child may refuse to participate in certain procedure, answer certain questions, or discontinue the experiment at any time without penalty. Prior to the study, I will explain the nature of the study, why I am doing it and all about participation in the study to your child using the attached verbal assent script. Prior to recording your child's voice, I will ask him or her "May I record your voice and include it in my study?" If your child says no, I will respect the decision and not use his or her data in my study. If your child withdraws from the experiment at any time, his or her performance data will not be used.

I hope you will approve your child's participation in my study, as you can indicate by signing and return the attached consent form. If you have any questions about this study, please contact the investigator, Emily Jambeau, Music Teacher at Bemis Elementary School, by phone: 248-823-4133, e-mail:EJambeau2@troy.k12.mi.us, or regular mail: 3571 Northfield Parkway, Troy, MI 48084. If you have any questions or concerns regarding your child's rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact – anonymously if you wish – Peter Vasilenko, PhD., Chair of the University Committee on Research Involving Human Subjects (UCRIHS) by phone: (517) 355-2180, fax: (517) 432-4503, e-mail:ucrihs@msu.edu, or regular mail: 202 Olds Hall, East Lansing, MI 44824.

Thank you very much!

Sincerely,
Mrs. Emily Jambeau

PARENTAL CONSENT FORM

Please return this form to Emily Jambeau if you consent to your child's participation in this study: The Effects of Music Improvisation Instruction on Elementary Students' Developmental Music Aptitude and Achievement of Singing in Tune.
I voluntarily agree to my child's participation in this study.

_____

Parent or Legal Guardian's Signature

_____

Date
Emily Jambeau
Bemis Elementary School
3571 Northfield Parkway
Troy, MI 48084

CHILD VERBAL ASSENT SCRIPT

"I would like to tell you about my research project that I am doing for my school, Michigan State University, where I am a student at. I am hoping you can help me with my project. I am trying to learn about what makes students like you better music makers and singers. We are going to take a few tests at the beginning and end of the year. For one test you would listen to music and decide whether two patterns are the same or different. For the other test you would sing two short songs into my CD recorder system. During the year, some of the first grade classes are going to do music activities that ask you to make up your own music and some of the classes are not going to do those activities. If you decide to help me with my project I can figure out if the activities where you make up your own music can help students like you to be better music makers and singers."
Prior to recording the child's singing voice, I will ask him or her: **"May I record your voice and include it in my study?"**

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