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An Investigation of the Effect of Harmonic Accompaniment on the Developmental Tonal Aptitude, Tonal Achievement, and Tonal Improvisations of Children in Kindergaten and First Grade presented by

Denise Marie Guilbault

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AN INVESTIGATION OF THE EFFECT OF HARMONIC ACCOMPANIMENT ON THE DEVELOPMENTAL TONAL APTITUDE, TONAL ACHIEVEMENT, AND TONAL IMPROVISATIONS OF CHILDREN IN KINDERGARTEN AND FIRST GRADE

By

Denise Marie Guilbault

A DISSERTATION

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

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ABSTRACT

AN INVESTIGATION OF THE EFFECT OF HARMONIC ACCOMPANIMENT ON THE DEVELOPMENTAL TONAL APTITUDE, TONAL ACHIEVEMENT, AND TONAL IMPROVISATIONS OF CHILDREN IN KINDERGARTEN AND FIRST GRADE

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The purpose of this research was to examine the effect of harmonic accompaniment on the developmental tonal aptitude, tonal achievement, and tonal improvisations of young children. The specific problems of this study were the following: 1) Does the addition of a root melody accompaniment to song instruction affect the developmental tonal aptitudes of children in kindergarten and first grade? 2) Does the addition of a root melody accompaniment to song instruction affect the tonal achievement of children in kindergarten and first grade? 3) Does the addition of a root melody accompaniment to song instruction affect the tonal achievement of children in kindergarten and first grade? 3) Does the addition of a root melody accompaniment to song instruction affect the tonal strength of the improvisations of children in kindergarten and first grade?

Sixty-eight kindergarten students and 68 first grade students (N = 136) from eight intact classrooms participated in the study. All children took the *Tonal* subtest of *Intermediate Measures of Music Audiation* as a pre- and post-test. Instruction lasted for 25 weeks and consisted of rote song instruction with root melody accompaniment (experimental group) and without root melody accompaniment (control group). Other than the use of root melodies, all children received the same instructional content. At the end of the 25-week instructional period, children performed a major criterion song, a minor criterion song, and improvised an ending to an unfamiliar song in major tonality. The song performances were audio-taped and rated by three independent judges for Tonality and Keyality. The improvisations were rated for Tonal Strength.

Results indicated that song instruction with a root melody accompaniment had no significant effect on the developmental tonal aptitude and tonal achievement of children in kindergarten and first grade. As would be expected, children in kindergarten received lower tonal aptitude mean scores and Tonality mean scores than children in the first grade. However, no significant difference was found between children in kindergarten and first grade for Keyality mean scores and Composite Tonal Achievement mean scores. Children who received song instruction with root melody accompaniment achieved significantly higher Tonal Strength scores when improvising than children who did not have such instruction. As would be expected, children in kindergarten scored significantly lower than the children in first grade.

Copyright by DENISE MARIE GUILBAULT 2002 This paper is dedicated to the memory of my father

Roland William Guilbault.

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CHAPTER ONE

INTRODUCTION

Singing has long been regarded as central to the elementary school music curriculum (Apfelstadt, 1984; Atterbury, 1984a, 1984b; Atterbury & Silcox, 1993; Cassidy, 1993; Clegg, 1966; Cooper, 1995; Flowers & Dunne-Sousa, 1990; Froehlich, 1977; Green, 1987; Hale, 1977; Kimble, 1984; Klinger, Campbell, & Goolsby, 1998; Levinowitz, Barnes, Guerrini, Clement, D'April, & Morey, 1998; Mizener, 1993; Rutkowski, 1986; Smale, 1988). In fact, the National Standards for Arts Education (1994) lists singing alone and with others as something all students (K-12) should know and be able to do. Many believe that singing has maintained this role in the curriculum because of its effect on (1) the development of musical understanding (Bertaux, 1989; Regelski, 1981; Smale, 1988; Waddell, 1989); (2) music aptitude (Gordon, 1997a); and (3) children's ability to audiate (Gordon, 1997a). In addition, musical understanding can be measured and assessed through children's singing (Barnes, Flowers & Dunne-Sousa, 1990; Froehlich, 1977; Hale, 1977; Levinowitz, Guerrini, Clement, D' April, & Morey, 1998; Rutkowski, 1996). When children sing, their performance is a reflection of their understanding of music.

In light of this, the development of children's vocal skills has been an important focal point of music research (Clegg, 1966; Cooper, 1995; Flowers & Dunne-Sousa, 1990; Green, 1987, 1990, 1994; Grutzmacher, 1987; Froelich, 1976; Hale, 1977; Kelly, 1998; Kimble, 1984; Levinowitz, Barnes, Guerrini,

Clement, D'April, & Morey, 1998; Moore, 1994; Rutkowski, 1986; Rutkowski, 1996; Stauffer, 1986; Welch, Sergeant, & White, 1995/96). The implications of these studies have helped general music teachers understand matters such as the processes required for accurate singing, the relationship between age and singing ability, the relationship between pitch discrimination ability and singing accuracy, and the effect of vocal range, melodic direction, intervals, vocal model, text, and unison/solo singing on children's vocal accuracy.

The typical child has the potential to learn to sing in tune, in meter, and in tempo (Atterbury, 1984b; Gordon, 1997c; Phillips, 1996); yet not all children mature into adults who are able to do so. Researchers have uncovered knowledge about some elements of singing that helps teachers understand how to facilitate children's vocal accuracy. Some of these elements are pitch discrimination, pitch production, pitch monitoring, and the motivation to sing (Atterbury, 1984; Goetze, Cooper, & Brown, 1990). One factor that has not received much attention from the research community is the effect of harmonic accompaniment on children's developmental tonal aptitude, singing achievement and improvisation. Perhaps this is because most music programs for primary children place more of an emphasis on pitch, melody, and rhythm and give minimal attention to harmony (Bridges, 1966) and because such programs rarely teach children to sing or improvise within the context of an underlying harmonic structure (Gordon, 1998b).

The Importance of Developmental Music Aptitude

Music aptitude is the measure of children's potential to learn music (Gordon, 1980b, 1986, 1989a, 1997a, 1997c, 1999). Aptitude is sometimes mistaken for achievement. Music aptitude represents a student's potential to learn, whereas music achievement represents what a student has learned. There are two classifications of music aptitude – developmental and stabilized. Children's music aptitude is developmental during the first nine years of life. During this time, the quality of the music environment can positively or negatively influence children's potential to achieve in music (Gordon, 1980b, 1986, 1989a, 1997a, 1997c, 1999). The environment ceases to have an effect on aptitude at about the time children are nine years old. At this point, aptitude becomes stabilized (unaffected by the environment) and will remain so throughout the child's life.

Differing perspectives on the origins of music aptitude have fueled many debates throughout the years. There are some who insist that music aptitude is innate and unaffected by environmental factors, while others hold the view that music aptitude is entirely environmental (Gordon, 1998a). Current findings in psychomusicology suggest that music aptitude is a product of both innate potential and musical environment (Gordon, 1998a). The proportion that nature and environment contribute to music aptitude is still unknown. What is known is that, regardless of aptitude level, children's potential to achieve in music will not be adequately developed unless they are exposed to a quality music

environment. In addition, the younger a child is, the greater the environmental influence will be (Flohr, 1981; Gordon, 1980a, 1980b; Taggart, 1997).

Numerous biologists, medical researchers, neurobiologists, neurologists, pediatricians, psychologists, and scientists have suggested that there are critical periods associated with the wiring of neurological connections and synapses that take place prenatally and throughout early childhood (Begley, 1996; Kotulak, 1993; Nash, 1997). Before birth and at critical periods after birth, a baby's brain produces an abundance of cells that are used to make connections, or synapses, between neurons (cells that carry electrical messages through the nervous system and the brain). While the brain contains nearly all the nerve cells it will ever need at birth, the pattern of wiring between them has yet to stabilize. Sensory experiences create the circuits for abilities such as vision, sight, hearing, smell, and language. A child's brain development suffers if deprived of a stimulating environment, because the brain eliminates those synapses that are seldom or never used.

The discovery that the outside world is indeed the brain's real food is truly intriguing. The brain gobbles up its external environment in bits and chunks through its sensory system: vision, hearing, smell, touch and taste. Then the digested world is reassembled in the form of trillions of connections between brain cells that are constantly growing or dying or becoming stronger or weaker, depending on the richness of the banquet (Kotulak, 1993, p. A8).

This applies to the development of the parts of the brain that processes music as well.

Thus, if a very young child has no opportunity to develop a music-listening vocabulary, the cells that would have been used to establish the hearing sense will be directed to another sense, perhaps the visual, and so the visual sense will be strengthened at the expense of the aural sense. Regardless of one's innate potential, no amount of compensatory education at a later time will be completely able to offset the handicap (Gordon, 1998a, p. 9).

The music environment of young children ought to be approached with great care in light of its significant effects on children's developing music aptitudes and future achievement.

The younger a child is when the child receives appropriate music instruction, the more a child will be able to achieve in music (Gordon, 1997a, 1997c, 1998a). Gordon developed three valid measures of tonal and rhythm developmental music aptitude that can be used to determine the strengths and weaknesses of individual children. The scores from these tests can also be used as a guideline when adapting instruction to the individual musical differences of children. *Audie* (Gordon, 1989b) is a developmental music aptitude test for three- and four-year-old children. A parent at home or a teacher in school individually administers the test. The *Primary Measures of Music Audiation* (Gordon, 1979) is a developmental music aptitude test for children in kindergarten through third grade. It is called a test of audiation and not a test of

aptitude, because aptitude is still developmental for children in this age group. The *Intermediate Measures of Music Audiation* (Gordon, 1982) was designed for groups in which half or more of the students score above the 80th percentile on the *Tonal* and *Rhythm* subtests of *Primary Measures of Music Audiation*.

Developmental music aptitude tests are extremely important, because, without them, teachers can only guess the potential of children based on their achievement (Gordon, 1998a; Taggart, 1989). The problem with this is that children sometimes underachieve. Music teachers cannot effectively evaluate a child based solely on what is observed. Some children will have high developmental music aptitudes and their musical behaviors will be commensurate, and sometimes they will not (Gordon, 1998; Taggart, 1989). It is through the use of music aptitude tests in conjunction with observation that music teachers can objectively identify the potential of the children that they teach. Only after objective measurement has been made of a child's aptitude and achievement in music can a teacher expect to make a dependable subjective evaluation (Gordon, 1997a).

Because all children have the potential to achieve in music, and because children's potential for future achievement is influenced by the quality of the music environment, it is important that children receive the best possible instruction. It is imperative that teachers understand the significance of developmental aptitude to facilitate the development of their students potential to the highest levels.

Children's Music Improvisations

Need for Improvisation

The quality and extent of one's early musical environment, which affects one's overall music aptitude, is perhaps the most powerful factor in determining the extent to which one can become musically creative (Gordon, 1989a). When a teacher provides students with the readiness and skills to create and improvise their own music, music becomes the property of the students themselves, and this should represent the ultimate goal of all music teachers (Azzara, 1992 & 1999; Gordon, 1997a). Improvisation means that an individual has internalized (can audiate) a music vocabulary and is able to understand and express intended musical ideas spontaneously.

Improvisation is to music what speaking is to language. Individuals improvise daily with language when engaged in conversation. Like an individual's contribution to conversation, improvisation in music is generated from an internal source. To understand music, one must think musically. Improvisation skills allow students to express musical thought and ideas from that internal source, with meaning (Azzara, 1992, pp. 6-7).

Although improvisation has been a vital part of music making throughout history, it is inexplicably missing from most school music curricula today (Azzara, 1992). The importance of improvisation as a valuable music skill is noted in the National Standards for Arts Education (1994), yet this is one of the standards that is least-successfully implemented (Adderly, 1999; Kirkland, 1996). The third content standard for children in kindergarten through fourth grade lists

improvising (1) musical "answers," (2) simple rhythmic and melodic ostinato accompaniments, (3) simple rhythmic variations and melodic embellishments, and (4) short songs as a music skill children should know and be able to do.

Gordon (1997a) states that, as a spontaneous expression of musical ideas, improvisation is a creative activity, but important differences exist between "creativity" and "improvisation." Creativity involves fewer restrictions than improvisation. Improvisation involves specific guidelines that provide structure for the improviser – for example, the tonality, the harmonic progression, the meter, and the form of the music. In addition, improvisation requires more complex audiation than creativity (Gordon, 2001).

Tonal improvisation may take several forms. Tonal improvisation may include a performance of a variation of a melody. This requires that the student can memorize and imitate. Awareness of tonic, resting tone, or harmony is helpful but not essential. Tonal improvisation may be the performance of a melody over a given harmonic progression, or it may be the improvisation of harmonic progressions to a melody. Both of these approaches require audiation skills. Tonal improvisation is most meaningfully accomplished when the improvisor is audiating a harmonic context (Gordon, 1997b & 1998b).

Experiences with improvisation have been shown to have a positive effect on student's other musical skills. The purpose of Azzara's study (1992) was to enhance the music achievement of elementary instrumental music students through a researcher-designed improvisation curriculum. The specific problems of his investigation were to examine (1) the effect of improvisation on music

achievement and (2) the effect of levels of aptitude on music achievement. Significant differences existed between students who received instruction that involved the use of the improvisation curriculum and those who did not. The treatment group received higher ratings on their performances of three criterion etudes than students in the control group. As expected, significant differences were also found between aptitude levels. The group of students who were classified as having high music aptitude demonstrated higher achievement than those students with low music aptitude.

Nature of Improvisation

Research has shown that improvisational and compositional processes and products can be used to evaluate musical understanding (Briggs, 1987; Brophy, 1999; Cohen, 1981; DeLorenzo, 1989; Doig, 1941, 1942a,b; Flohr, 1980, 1981,1985; Fruendlich, 1978; Joseph, 1983; Kratus, 1985, 1986, 1989, 1991a, 1991b, 1991c, 1994, 1995, 1996; Laczo', 1981; Montano, 1983; Moorhead & Pond, 1978; Martin, 1993; Munson; 1986; Pond, 1981; Prevel, 1979; Reinhardt, 1990; Webster, 1989). Children can and do improvise and compose in meaningful ways. Improvisation is the focus of the present study; therefore, composition will not be discussed.

A few researchers have examined children's tonal improvisations. During the 1940's at the Pillsbury Foundation School in Santa Barbara, California, Moorhead & Pond (1978) published one of the first naturalistic studies on children's improvisations. They observed and recorded the spontaneous singing,

chanting, and instrument playing of children, age two through six. Moorhead and Pond found that, with guidance and experience, young children could (1) improvise tonal and rhythm patterns, (2) improvise with a steady beat, and (3) improvise asymmetrical patterns. Early attempts at instrumental improvisations primarily involved tone and timbre explorations.

Prevel (1979) examined over 2,000 children's spontaneous improvisations in a free and unstructured environment. His observations suggest that children's motor energy is reflected in their first attempts at improvisation. What is most important to children is that they identify with the overall effect of their own music making. When children gain the ability to restrain their own movements, they experiment with different colors of sound and different volumes of sound. They also create accents, conclusions, and even introductions. He concluded that the development of children's improvisations owes more to their kinesthetic development than their auditory perception.

Flohr's research (1980) suggests that young children can meaningfully improvise music that incorporates simple musical structures. Flohr observed the improvisational behaviors of four-, six-, and eight-year-old children over a period of ten 15-minute individual sessions. The children improvised on an Orff xylophone using a two octave pentatonic scale. Each child individually participated in three improvisatory phases. The first phase was free exploration. The children were given five minutes to freely explore the sound possibilities of the instrument. The second phase, guided exploration, consisted of a series of eight researcher-directed tasks. Phase three was exploratory improvisation.

Flohr performed "Hush Little Baby," and then asked the children to make up a song. Flohr played a bordun accompaniment on the bass xylophone while each child improvised.

Flohr concluded that (1) young children could freely improvise music that employs musical patterns and complex rhythms; (2) the characteristics of children's improvisations change in relation to chronological age; (3) older children maintain focus on the sound possibilities of a single instrument longer than four-year-old children; (4) a sense of tonality and consistency in improvisations become more evident as children mature; (5) young children can improvise patterns that are related to musical stimuli; and (6) young children are able to create musical images in response to verbal stimuli.

In a 1985 study, Flohr characterized and described the behavior of four different age groups (ages two through five) engaged in improvisatory tasks. Ten children from each of the four age groups served as subjects (N = 40). Flohr met with the children each year for four years. Four of the children participated in the study for all four years. Eight children participated for three of the years, seven children for two years, and 10 children participated for one year. As in Flohr's 1980 study, each child individually participated in a three-phase interview.

The results of Flohr's study led him to conclude that there are differences in children's improvisations that are related to chronological age. He proposed three stages of improvisational development. Stage one, motor stage, is characterized by slow and accented durations. He found that the two-year-olds

were more interested in the sounds the instrument made and were motivated primarily by the physical movement involved in the production of sound.

In stage two, experimentation, children experiment with their ability to produce a variety of sounds. Children tend to focus on motives exclusively, explore many techniques for sound production, imitate the bordun rhythm, and use quarter-note triplets, asymmetrical phrases, stepwise motion, and repeated pitches. Sequences, inversions, variations, and repetitions can occasionally be found in stage two improvisations.

Improvisations in stage three, formal properties, reflect the child's understanding of musical form; improvisations end with short codas and correspond to the length of the bordun accompaniment. Additionally, children showed a preference for the pentatonic scale centered on the f tonality or the related minor tonality of d.

Reinhardt (1990) examined preschool children's use of rhythm in improvisation in order to describe the rhythmic elements found in the children's improvisations and to determine if there were significant differences in the use of rhythmic elements among the age groups. Analyses of the rhythmic characteristics show that children were able to establish and maintain a steady pulse and to establish and maintain the meter. Reinhardt proposes that the ability to improvise with a steady beat and meter is stabilized by the time children are three years old. Five-year-old children had the highest number of different durations, and the three-year-old children had the least amount of different durations. The differences were statistically significant in both cases. Reinhardt

suggests that the use of different durations is in development between the ages of three and five. The number of improvisations that did not contain a rhythm pattern was highest for the three-year-old children and lowest for the five-yearold children. Extended rhythm patterns were observed less often for the threeyear-old children and most often for children five years of age. Again, Reinhardt suggests that the use of rhythm patterns in improvisation develops between the ages of three and five years.

Freundlich (1979) conducted two case studies of fifth grade boys in order to examine the development of musical thinking. The two boys improvised using a diatonic xylophone in the context of a 12-bar blues progression in the keyality of A. Freundlich held "jam sessions" with the individual students once a week for 11 weeks. The children improvised on the xylophone while Freundlich performed a rock and roll accompaniment on the guitar.

Freundlich concludes that children can produce musical ideas without relying upon notation. On the other hand, the "rhythmic buoyancy" of the blues progression may have "inhibited the child's ability to deal successfully with melodic-harmonic issues" (p. 59).

This study is troublesome on several accounts. First, Freundlich classified his study as longitudinal when it consisted only of 11 weekly five-minute sessions. Second, the use of an A major blues accompaniment with a diatonic xylophone pitched in C seems ill-advised. Freundlich should have replaced the tone bars so that the xylophone could play in the same key as the guitar accompaniment. Perhaps this, rather than the "rhythmic buoyancy" of the blues

progression, inhibited the boys' abilities to improvise successfully in a harmonic context. Third, little information was given about the subjects in this study. Background information and interviews or discussions with the students might have provided insight into their thought processes when improvising.

Brophy (1999) studied the instrumental (alto xylophone) improvisations of 280 six- through twelve-year-old children. The children were asked to improvise on the B, C, and D sections of a rondo. The analysis of individual melodic features suggest that the use of specific ranges and intervals, the use of specific type of melodic motion, and the use of the tonic as a closing tone were not related to age (76% of the children did not end on the tonic). The use of repeated and developed melodic motives increased significantly with age. Older children tended to experiment with their improvised melodic motives while younger children repeated a melodic motive (or used no motive at all). Overall, melodic features show significant differences among age levels.

The analyses of individual rhythmic features suggest that the use of rhythmic divisions were related to age. The presence of beat divisions that form rhythmic patterns significantly increased with age. Younger children improvised melodies that were less consistent in terms of a steady pulse than older children. Nine-year-olds were the most consistent with tempo. Significant differences were also found between the children's use of repeated and developed rhythmic motives. Older children repeated and developed rhythmic motives more frequently than younger children. Significant change did occur with age, which suggests dynamic stages of rhythm development. The development of the

combined rhythmic features occurs from ages six through nine, as seen by the steady progression toward the use of conventional rhythmic features in improvisations. Between the ages of nine and ten, there appears to be a developmental plateau, in which the growth temporarily ceases but reappears at age 11 and continues through age 12.

The analyses of the structure features for the presence of phrase suggest significant age-related differences. Older children improvised melodies that were structured in phrases more often than younger children. Also, older children improvised melodies that were structured in antecedent/consequence phrases. Overall, results show significant differences between and among age levels, although these changes did not exhibit a consistent increase as the differences in age level increased. The differences in the use of structural features between ages six and nine, between eight and nine, and also between ages eight and 12 were significant. No significant difference was found between ages eight and ten/11. The presence of structural features increases significantly between ages six through nine, with the most rapid growth occurring between ages eight and nine. There is a decline in the presence of structural features at age ten, and then a resumption of growth at ages 11 through age 12.

The three Total Improvisation Scores provided a measure of the musical characteristics of each of the three improvisations as an eight-measure musical entity. There were significant differences between and among age levels for each of the three improvisations. Significant differences were found between

ages six and seven, ages nine through 12, and between ages eight and nine for the third improvisation.

The Overall Composite Score represented the three improvisations as a 24-measure musical product. The results suggest that the combined characteristics of the improvisations change significantly with age. The scores significantly increase between ages eight and nine, and this increase serves to partition the six- through eight-year-olds and the nine- through 12-year-olds into two significantly different groups. Brophy suggests that a dynamic stage may exist in the development of the overall characteristics. The first dynamic stage can be identified as ages six through nine. During the first stage, the six-, seven-, and eight-year-olds progress steadily toward a musical conformity in their improvisations, with a period of rapid growth between ages eight and nine. A developmental plateau occurs for ages nine through 11, with growth resuming at age 12.

Munsen (1987) investigated children's (grades one, three, and five) ability to improvise rhythmically and melodically (vocally and instrumentally) within a question and answer format, in the context of an Orff-Schulwerk-based music program. The children's improvisations during the regular music class were tape-recorded and rated with regard to rhythmic/tonal security, phrase length, rhythmic/melodic final point, musical congruence, rhythmic/melodic organization, originality, and overall musical impression. Munsen concluded that there was a noticeable difference between the improvisations of children in grades one and three. Children in grade three received higher ratings for their improvisations

than children in the first grade. This was due in part to maturation and also in part to the fact that children in first grade had less opportunity to improvise than had children in the third grade. Little difference was found between the improvisations of children in grades three and five. Again, because of the instructional format, children in third grade received more opportunities to improvise than did children in the fifth grade.

Martin (1993) replicated Munsen's (1987) study. Martin found that children in first grade were rated the highest of the three grade levels on their melodic improvisations. Martin suggests that one possible explanation for the high first-grade melodic improvisation scores is that the improvisations of these children were quite structured (consisting of sol-mi-la melodies), while the fifthgrade students were encouraged to display originality. Children in the third and fifth grade were aware of the eight-beat phrase length and beginning and ending notes for a particular tonality. Children in the fifth grade received the highest scores for rhythmic improvisations. In addition, fifth-grade students received the highest scores for overall musical impression.

Laczo' (1981) investigated the psychological aspects of the improvisation abilities of lower and upper grade levels of elementary school children. The problems of his study were to 1) identify types of melodies improvised by different ages and types of education, 2) identify factors that influence the achievement of improvisation of different ages and types of education, 3) see if differences existed in improvisations with text and without text, and 4) identify

connections between the musical activity and passive recognition as measured by the Seashore test.

Children from three schools in Budapest, Hungary participated in the study. One of the schools had classes specializing in music using the Kodaly philosophy. Another school specialized in foreign language. The third school held normal classes, and all children attended two music classes each week. Data collection consisted of two tasks: 1) to vocally improvise a melody using the text of a short poem and 2) to vocally complete a melody (without text).

Laczo' found that the types of melodies of the most advanced improvisations with text had a sense of tonality, relatively correct intonation, wellstructured musical material, and accurate orientation in the rhythmical-time relations. The types of melodies of the most advanced improvisations without text had a sense of tonality, tone-system and formation, and cohesion between the question and answer. The majority of improvisations were in pentatonic. Students in the lower classes achieved better rhythmic accuracy in without-text improvisations. With regard to rhythm, students performed with greater accuracy in their improvisations with text regardless of the school attended. Students in the lower and higher classes achieved better intonation accuracy in without-text improvisations. The with-text improvisations of lower school children in the language and normal classes were better than the text improvisations of lower school children in the specialized music classes. Overall achievement in both text and no text improvisations was higher for students in the specialized music classes, regardless of age, than in the other two types of classes. The scores

students received on the Seashore measure were not predictive of their achievement in improvisation. Students who received low aptitude scores improvised at higher levels than would be expected. Laczo' concludes, "the musical education and the accumulated musical experiences are decisive in the achievement of improvisation" (p.41). In addition, "intensive musical education has priority over chronological maturity. Achievement depends on skill" (p. 42).

Effect of Instruction on Improvisation

It is important that children have the readiness and skills to improvise their own music. Music educators need to know the most appropriate and productive means to help children develop the ability to improvise. The following section presents studies that examine the effect of instruction on children's improvisations. These will be discussed in more depth in chapter two.

Wig (1981) examined the viability of music composition strategies in teaching sixth- and eighth-grade band students' (N = 28) to improvise. Wig found that significant gains were made in improvisation ratings after the composition instruction.

Joseph (1983) sought to determine if a kindergarten music program based on Dalcroze Eurhythmics would develop children's instrumental improvisational skills. She proposed that children receiving improvisation instruction would outperform children who did not receive improvisation instruction. Joseph found that children receiving Eurhythmics training with improvisation instruction used

more patterns when improvising on a set of chromatic bells than those children not receiving improvisation instruction.

Kalmer and Balasko (1987) examined the improvised songs of Hungarian preschool children (N = 30) to determine if the music they were learning in their classes created a musical vocabulary (referred to as "mother tongue") that was reflected in their vocal improvisations. Kalmer and Balasko suggest that the "musical mother tongue" (p.83) does exist. Typical features of the Hungarian folk songs (volume, tonality, intervals, structure, phrases, rhythm patterns) were identifiable in the children's improvisations.

Amchin (1995) investigated the effects of teacher/student verbal interactions on the improvisations of fourth- and fifth-grade students (N = 129). He sought to "measure whether exposure to improvisation activities found in the Orff-Schulwerk along with teacher-student interactions designed to help children evaluate their creative responses influences children to produce more musical improvisations" (p. 8). He found no significant difference in the improvisations of children who had had teacher-led discussions about their improvisations and those children who did not.

Partchey (1974) examined the effects of three learning strategies on the ability of sixth-grade students to improvise melodies. Students were randomly assigned to one of three groups: 1) delayed feedback - the students immediately heard a replay of their improvisation before improvising the second time; 2) precomposed models - students heard a correct model in expectation that it may positively influence subsequent improvisations, and; 3) repetition or control group

- received the same number of opportunities to improvise but did not experience one of the two experimental strategies. This group served as the control for the effect of practice on the pretest/posttest scores.

Partchey found no significant pretest/posttest mean score gains between the groups. Statistically significant pretest/posttest differences occurred between all groups in the creativity and performance-creativity combined scores. Overall, Partchey concluded that all three strategies do induce some measure of learning as manifested in the ability to improvise melodies. All three strategies improved improvisational ability.

Summary

Brophy (1999), Flohr (1980, 1985), Freundlich (1979), Martin (1993), Munsen (1987), Moorhead & Pond (1978), Prevel (1979), and Reinhardt (1999) show that children can improvise on an instrument using repeated and developed melodic and rhythmic motives. They can also establish and maintain a steady beat, maintain meter, maintain tonality, organize structural features (introductions and codas), use different colors of sound, use different volumes of sound, and use accents when improvising. Laczo' (1981) found that children could improvise vocally with a sense of tonality, relatively correct intonation, wellstructured musical material, and accurate orientation of rhythmical-time relations. Amchin (1995) found that instruction that included verbal interaction did not affect children's improvisations. Partchey (1974) found that improvisational skills improved regardless of the learning strategy used.
Little research exists on young children's vocally performed improvisations. Furthermore, no research exists on the effects of vocal instruction that includes a harmonic context on improvisational abilities. Research is needed on the effects of a harmonic context on the vocal improvisations of young children. When it comes to children having the necessary readiness to improvise, it may be familiarity and comfort with chord changes that is the compelling factor (Gordon, 2001).

Harmonic Context

How might teachers guide students toward familiarity and comfort with chord changes? Students can broaden their music vocabulary by listening to and learning music by ear. The process of learning by ear and developing musicianship begins at birth when children hear the music of their culture (Gordon, 1997c). In addition to learning the melody, students should learn the bass line and the harmonic progression for numerous tunes. Listening to bass lines help students develop a melodic sense of harmonic progression, that is, a sense of how melodies combine to create harmony. Azzara (1992, 1999) suggests that students should learn to sing and play the bass lines of tunes by ear, as he believes that knowing many melodies and bass lines is an invaluable resource for improvising. As a result of learning songs and bass lines, students will develop an understanding of how tones function within the harmony. Students may also sing and perform with more accuracy. Bass lines provide tonal context and meaning for musical performance.

There are differing views as to the best techniques for helping students perceive harmonic functions. Ritchie (1962) was interested in determining, with sophomore college students (N = 58), whether the aural perception of melodic fragments was enhanced or inhibited by the use of harmonic accompaniments. He designed a 95-item test to compare the aural perception of various melodic fragments presented as single lines with the aural perception of the same melodic fragments appearing as the upper voices of four-part diatonic harmonies.

The melodic fragments were classified as belonging to one of two types – diatonic (stepwise movement) or triadic (intervals of a minor third and larger). Each melodic fragment was harmonized in a variety of ways. The harmonizations were classified as follows: "Class I – triadic fragments using only primary triads for the harmonization; (2) Class II – triadic fragments using any triad or triads other than primary triads for harmonization; (3) Class III – diatonic fragments using only primary triads for the harmonization; Class IV – diatonic fragments using any triad or triads other than primary triads for harmonization; Class IV – diatonic (p. 14).

Ritchie found that (1) harmonization tended to decrease the accuracy of aural perception, (2) harmonization using secondary triads decreased accuracy of aural perception to a greater degree than harmonization consisting entirely of primary triads, and (3) that the number of chord changes did not seem to be a factor in the perceptibility of melodic fragments.

In order to identify the most effective means of teaching seventh- and eighth-grade general music students (N = 106) to identify primary harmonic

functions, Alvarez (1980a) compared two harmonic classification systems – scalar and root. The scalar harmonic classification system was used to identify primary harmonic functions by classifying the progressions into one of three classes using only the first, seventh, and second scale degrees – tonic: I, IV, vi, dominant: V, vii, iii, and pre-dominant: ii. For example, the chord progression of I-iii-vi-ii-V-I in the tonality of C major using the scalar system would have a bass line consisting of the pitches C-B-C-D-B-C. The root harmonic classification system was used to identify primary harmonic functions by classifying the progressions into one of seven classes using all diatonic scale degrees. For example, the chord progression of I-iii-vi-ii-V-I in the tonality of I-iii-vi-ii-V-I in the tonality of C major using the progressions into one of seven classes using all diatonic scale degrees. For example, the chord progression of I-iii-vi-ii-V-I in the tonality of C major using the tonality of C major using the tonality of C major using the progressions into one of seven classes using all diatonic scale degrees. For example, the chord progression of I-iii-vi-ii-V-I in the tonality of C major using the tonality of C major using the tonality of C major using the progression sinto one of seven classes using all diatonic scale degrees. For example, the chord progression of I-iii-vi-ii-V-I in the tonality of C major using the root system would have a bass line consisting of the pitches C-E-A-D-G-C.

There was no significant difference in the ability to identify primary harmonic functions using root position chords between students who learned the scalar system and students who learned the root system. However, students who received instruction using the scalar technique were more adept at identifying primary harmonic functions than students who were taught the root technique. Alvarez concluded that the scalar technique is more effective than the root technique in teaching seventh- and eighth-grade students to identify primary harmonic functions.

In another study, Alvarez (1980b) investigated the most effective means of teaching college students (N = 48) enrolled in one of four ear-training courses to identify harmonic functions. Again, two harmonic classification systems were used to teach harmonic identification – scalar and root. The intact classes were

randomly assigned to either a scalar or a root classification system. Each class received ten 50-minute sessions of instruction.

Results of the Alvarez (1980b) study show that the scalar classification system yielded significantly higher mean scores on both subtests than did the root classification system and, therefore, was the more effective means by which to teach the identification of harmonic functions. Alvarez states that the results may be due to the following: (1) the scalar system consisted of three relevant attributes (scale degrees one, seven, and two) whereas the root classification system consisted of seven relevant attributes (all diatonic scale degrees); (2) all relevant attributes of the scalar system were within the interval of a second of the tonic pitch, whereas the relevant attributes of the root system encompassed a larger interval above and below the tonic pitch; (3) the intervals of the relevant attributes in the scalar system did not have to be inverted, whereas ascending and descending intervals of the relevant attributes in the root system frequently had to be inverted; and (4) the scalar system group was able to use the same procedure for both root position and inverted harmonic functions, whereas the root groups had to determine whether the perceived bass tones were actual roots or inverted chord members.

Although older children and college students may be more successful at identifying harmonic functions using the scalar technique, young children may need a different type of instruction. Children's ability to audiate grows from their ability to differentiate between sounds that are the same and not the same (Gordon, 1997c, 1998a). Children who have listened to a wide variety of sounds

may develop a more sensitive ear than children who have not had the same listening experience. This idea may apply to harmonic perception as well. The scalar approach uses only three classifications, and therefore has limited possibilities for making harmonic function comparisons. The root technique uses seven classifications, and, as a result, may provide young children with more opportunities to differentiate among and ultimately understand harmonic functions.

Summary

The results of the above studies are insufficient to determine the best venue for helping students develop an understanding of harmonic progression. Perhaps the use of primary triads best serves this goal (Ritchie, 1962). It is also possible that the scalar technique is a superior method (Alvarez, 1980a, 1980b). Although research suggests that the root technique is inferior to the aforementioned techniques (Alvarez, 1980a, 1980b), more research is needed before a solid conclusion can be made. None of the studies mentioned above involved young children. In relation to early childhood, the root technique may be preferable. Since the root technique is the method suggested by Azzara, (1992) and there is insufficient data to either confirm or refute its effectiveness, further research is needed so that findings are conclusive.

The Focus of This Research

The effect of instruction on developmental tonal aptitude, tonal achievement, and tonal improvisation lies at the core of the present study. Music instruction during the first nine years of life can determine the extent to which children give meaning to and derive pleasure from music throughout the remainder of their lives (Gordon, 1997c, 1998a). Singing is an important vehicle for supporting children's tonal aptitudes and measuring children's understanding of music syntax. Researchers have devoted much energy to unearthing the instructional factors that are most beneficial in supporting the development of the young child's singing. One instructional factor that has not received much consideration is the effect of harmony on children's singing as well as on their developmental tonal aptitude. Furthermore, there are no studies that investigate the effect of harmonic accompaniment on young children's vocal improvisations.

Purpose and Problems of the Study

In order to improve music instruction and to define factors necessary for creating the optimal environment for music development, the purpose of this research is to examine the effect of root melody accompaniment on the developmental tonal aptitude, tonal achievement, and tonal improvisations of young children. The specific problems of this study are the following:

 Does the addition of a root melody accompaniment to song instruction affect the developmental tonal aptitudes of children in kindergarten and first grade?

- 2) Does the addition of a root melody accompaniment to song instruction affect the tonal achievement of children in kindergarten and first grade?
- 3) Does the addition of a root melody accompaniment to song instruction affect the tonal strength of the improvisations of children in kindergarten and first grade?

Definitions

Developmental Music Aptitude – The potential to achieve in music. It is affected by the environment (until children are approximately nine years of age) and can be measured by *Intermediate Measures of Music Audiation*.

- Root Melody Accompaniment The melodic line created by the fundamental pitch of the harmonic functions found in the songs.
- Tonal Strength The degree to which children maintain a tonality and keyality when improvising.
- Tonal Achievement Children's ability to sing tonic, dominant, subdominant, and cadential patterns accurately within the context of a major and minor song, as well as to remain in the given keyality of the songs.

Limitations

 Although there are many means through which to measure children's tonal achievement, the present study will be limited to measuring children's ability to sing tonic, dominant, subdominant and cadential patterns accurately within the context of a major song and a minor song as well as to remain in the given keyalities of the songs.

- 2. Although there are many means through which to measure children's tonal improvisations, the present study will be limited to children's abilities to maintain a tonality and keyality when improvising.
- Generalization of the results of this study is limited by the specific characteristics of the children and the school in which the study was conducted.

CHAPTER TWO

RELATED LITERATURE

The focus of this study is on the effects of root melody accompaniment with song instruction on the developmental tonal aptitudes, tonal achievement, and tonal improvisations of young children. Therefore, the literature that is directly related to this study falls into four categories. They are the following: (1) studies that consider the effect of instruction on developmental music aptitude, (2) studies that consider the instructional factors that affect children's singing abilities, (3) studies that consider the effect of instruction on children's improvisations, and (4) studies that consider the effect of harmonic accompaniment on children's music development. This review comprises a discussion of each of those categories of study.

The Effect of Instruction on Developmental Tonal Aptitude

Several researchers have examined the effect of music instruction on developmental tonal aptitude (Jordan-DeCarbo, 1982; Levinowitz, 1987; Lange, 2000; Kane, 1994; DiBlassio, 1985; Holahan, 1983; Jessup, 1984; Rutkowski, 1986; Rutkowski, 1996; Flohr, 1981; Taggart, 1997; Gordon, 1980a; Gordon, 1980b). Gordon's Music Learning Theory states that tonal and rhythm aptitude is developmental and fluctuates until approximately age nine, depending on the quality of the music environment and instruction (Gordon, 1997a, 1997c). The

following section includes studies that corroborate the theory that instruction strengthens and supports developmental tonal aptitude. Still, there are contradictory views as to the influence of instruction on developmental music aptitude. These are presented first in this discussion.

Jordan-DeCarbo (1982) investigated the effect of training using same/different discrimination techniques on kindergarten children's aural perception and vocal performance of tonal patterns and a song. Four questions were addressed in her study: (1) Does involving children in a decision-making process (discerning same or different) affect aural discrimination and singing of selected tonal patterns? (2) Does gender of kindergarten children interact with aural ability as measured by aural discrimination (Primary Measures of Music Audiation) and singing? (3) Does readiness training that includes the singing of songs and resting-tone recognition influence aural ability as measured by aural discrimination (PMMA) and singing skills? (4) Does reinforcing tonal patterns with songs that provide a tonal framework influence aural discrimination (PMMA) and singing? The following discussion will only include information relevant to the first, third and fourth problems, as they are the most closely related to the present study. In this study, Jordan-DeCarbo uses the term aural discrimination synonymously with music aptitude.

Five intact classes of kindergarten children (N = 89) from three different elementary schools were randomly assigned to one of two groups. Children in experimental group one received tonal pattern instruction using the same/different technique of asking children to aurally discriminate between two

patterns. The children in the second experimental group received the same tonal pattern instruction but responded through imitation and repetition rather than aural discrimination. Children received three 20-minute periods of instruction each week for 11 weeks. Jordan-DeCarbo administered the tonal subtest of PMMA, as well as two researcher designed singing achievement tests.

Results of this study show there was no significant difference in the tonal subtest scores of PMMA or in the singing achievement test scores between the two experimental groups. However, there were significant gains from pretest to posttest on both the tonal subtest scores of PMMA and the singing scores, regardless of treatment. Jordan-DeCarbo was unsure as to whether the gain was due to the effect of training or maturation.

Levinowitz (1987) conducted a study to determine the effects of song instruction with words and without words on the levels of developmental tonal aptitude and singing achievement of children in kindergarten and first-grade. The *Tonal* and *Rhythm* subtests of *Primary Measures of Music Audiation* were administered to children at the beginning and end of the academic school year. The children were randomly assigned to one of three treatment groups: (1) songs primarily with words, (2) songs primarily without words, and (3) songs always with words.

Levinowitz found that mean gain scores for the *Tonal* and *Rhythm* subtests of PMMA of children with low aptitudes were significantly higher than those of children with high aptitudes, regardless of treatment group. It is possible that singing, regardless of whether one uses text, raises the aptitude of low

aptitude children. However, this could also be a result of regression toward the mean. There was not a significant difference between the pretest and posttest scores of children with high aptitudes for any of the three groups. No significant differences were found in the tonal achievement scores between children in the two experimental groups or between children with low and high developmental tonal aptitude.

A portion of Lange's (2000) study was designed to consider the use of text in song instruction and its possible effect on the developmental tonal aptitudes of children in kindergarten. She also examined whether the use of text in song instruction would affect children's ability to identify and perform the resting tone.

Children from four intact kindergarten classes from two different elementary schools served as subjects for the study. Two classes (one from each school) were randomly selected to receive song instruction primarily with text for a period of 24 weeks. During the same 24 weeks, the remaining two classes received song instruction primarily without text.

Using the children's gain scores from PMMA, Lange found no significant difference between the tonal aptitude scores of the two treatment groups. However, Lange did find statistically significant effects as a result of tonal aptitude level. As expected because of the phenomenon of regression toward the mean, children with low tonal aptitude had higher gain scores than did children with high tonal aptitude. However, although the difference was not statistically significant, the low tonal aptitude children who received song instruction without text had higher gain scores than low tonal aptitude children

who received song instruction with text. There was no significant difference in the song or resting tone performances of children with low and high aptitudes regardless of treatment group.

A portion of Kane's study (1994) examined the effects of tonal pattern instruction and song instruction on the developmental tonal aptitudes of kindergarten children. She was specifically interested in the difference between instruction that included the singing of tonal patterns and songs without words in a variety of tonalities and meters (experimental treatment) and instruction that included the traditional teaching of rote songs with words in major and harmonic minor and duple and triple meters (control).

Eighty-seven children from four intact classes participated in the study. Two of the four classes were randomly assigned to serve as the experimental group. They received 30 weeks of instruction that included tonic and dominant tonal patterns in major and minor tonalities and songs without words in a variety of tonalities and meters. The remaining two groups were identified as the control group and received 30 weeks of instruction using traditional rote songs with words in major and harmonic minor tonalities and duple and triple meters.

The experimental and control groups were administered *Primary Measures of Music Audiation* at the end of October and then again at the beginning of May. It is unclear whether the *Tonal* subtest alone was administered to the children or whether both subtests were administered. Kane does report that only the data from the *Tonal* subtest was used in the analysis.

Kane provided instruction (the amount of instruction is not stated) to the four classes during the months of October and November and used this time to prepare two kindergarten classroom teachers to assume the role of music instructor. She demonstrated guidance techniques with tonal patterns and song instruction that were relevant to the experimental group and modeled techniques for rote song instruction that were pertinent to the control group. Beginning in December and continuing through April, the two kindergarten classroom teachers provided 10 minutes of music instruction four days per week. Each teacher, one male and one female, taught an experimental group and a control group. Kane also conducted weekly meetings with the teachers to present new tonal patterns and songs to be used the following week and to answer questions that arose during the instructional period.

To determine the effect of singing instruction on developmental tonal aptitudes, Kane examined the difference between the mean gain scores of PMMA *Tonal* subtest for the experimental group and control group. Although not statistically significant, the experimental group had a higher observed mean gain score from pretest to posttest than did the control group. Kane suggests this may be due to the small number of subjects participating in the study and/or that the benefits of instruction may appear later when the child's music aptitude stabilizes. Kane concludes that there is no evidence to suggest that instruction involving the singing of songs without words in a variety of tonalities and meters has a greater effect on the developmental tonal aptitude of kindergarten children than traditional instruction of rote songs with words.

DiBlassio (1985) examined four methods of tonal pattern instruction and four methods of rhythm pattern instruction to determine which had the greatest effect on developmental tonal and rhythm aptitude, respectively. Sixteen classes of first-grade students participated in the study. The classes were divided into two groups of eight. One group was administered the *Tonal* subtest of *Primary* Measures of Music Audiation and received tonal instruction for 12 weeks. The tonal pattern instruction was divided into the following four combinations of tonalities: Group I, major and minor; Group II, major, minor, dorian, and mixolydian; Group III, major, minor, and atonal; and Group IV, pentatonic. The other group of eight classes was administered the *Rhythm* subtest of *Primary* Measures of Music Audiation and received rhythm pattern instruction for 12 weeks. The rhythm pattern instruction was divided into the following four combinations of meters: Group I. duple and triple: Group II. duple, triple, and combined; Group III, duple, triple, unusual paired, and unusual unpaired; and Group IV, duple, triple, combined, unusual paired, and unusual unpaired. At the conclusion of the 12-week instructional period, students were administered the *Tonal* or *Rhythm* subtest of PMMA, depending on their group classification, to determine the effect of instruction on developmental tonal aptitude or developmental rhythm aptitude. No significance was found according to treatment. However, as expected, DiBlassio found that students with low aptitude made greater gains than the students with high aptitude in both treatment groups.

Holahan (1983) investigated "same" and "different" instructional techniques on kindergarten students' developmental music aptitudes. The students were divided into the following four groups: (1) teacher labeling tonal patterns as the same, (2) teacher labeling tonal patterns as different, (3) teacher labeling tonal patterns as the same, (2) teacher labeling tonal patterns as different, (3) teacher labeling tonal patterns as the same, (2) teacher labeling tonal patterns as different, (3) teacher labeling tonal patterns as the same and different, and (4) no labeling of patterns. Prior to instruction, the students were administered the *Tonal* and *Rhythm* subtests of *Primary Measures of Music Audiation*. PMMA was administered again following the eight-week tonal pattern instruction period. Holahan found no significant difference among the children in the four treatment groups. However, the developmental tonal aptitude of all students increased significantly from the beginning to the end of the instruction period. Holahan suggests that future research may include a longitudinal study to determine if the results are due to maturation or instruction.

Jessup (1984) attempted to determine the comparative effects of teacher behavior on developmental music aptitude, music listening achievement, and the performance of songs of second-grade students. PMMA was administered to students as a pretest measure. Instruction lasted for 12 weeks, with two teachers teaching two classes each. One class of each teacher received primarily directive teacher instruction and the other received primarily indirect teacher instruction. The teaching curriculum was selected from Book 2 of the *Silver Burdett* music series. After 12 weeks of instruction, PMMA was administered as a posttest. Students were also asked to complete items from the *Silver Burdett Music Competency Tests*, perform the tonal and rhythm

patterns, and perform a rote song. Not surprisingly, Jessup found that the PMMA scores of students with low music aptitude increased significantly more than those of high aptitude students. Also high aptitude students achieved significantly more on rote singing, pattern performance, and music listening tests than low music aptitude students.

Rutkowski (1986) investigated the discrepancies found between the pitch range of songs in music curriculum textbooks and the natural voice range of kindergarten children (N = 162). The thought behind her research was that singing beyond one's vocal range may not only affect the use of singing voice; it may also have an effect on developing music aptitude. In addition, Rutkowski examined the possible relationship between children's use of singing voice and developmental music aptitude.

Over a period of 15 weeks, one group of kindergarten children received music instruction that included songs with a restricted vocal range. Another group of kindergarten children received music instruction that incorporated textbook songs in their original form. Prior to the treatment period, the children were taught a criterion song and five tonal patterns. Rutkowski's Singing Voice Development Measure (SVDM) was used as a pretest measure of children's use of singing voice. Reliabilities were as follows: (1) r = .74 for the pattern pretest; (2) r = .93 & .94 for the song pretest; (3) r = .91 & .97 for the pattern posttest; and (4) r = .88 & .92 for the song posttest. She also administered the *Tonal* and *Rhythm* subtests of *Primary Measures of Music Audiation* (Gordon, 1979) to

measure the children's developmental music aptitude levels before treatment. Both measurement instruments were also used as posttest measures.

The results of Rutkowski's study suggest that music instruction using songs within a restricted voice range does not significantly affect developmental music aptitude differently from instruction that includes songs outside of children's natural voice range. However, PMMA gain scores (*Tonal* and *Rhythm* subtests) for the restricted voice range group were higher than those of the control group. Furthermore, it appears that there may be a weak relationship (r = .25 to .45) between children's use of singing voice and their developmental tonal aptitudes. The relationship between tonal aptitude and singing voice achievement appears to be stronger than the relationship between rhythm aptitude and singing voice achievement.

Two aspects of the 1996 study by Rutkowski were to determine (1) the effect of individual and small-group instruction on developmental music aptitude and (2) whether or not a relationship existed between children's use of singing voice and developmental tonal aptitude. The yearlong study included kindergarten children (N = 99) from intact classrooms that were randomly assigned to either the control (group activities only) or treatment group (small-group and individual activities).

The *Tonal* subtest of *Primary Measures of Music Audiation* (PMMA) was administered as a pretest, midtest, and posttest. The children's song performances were taped at the beginning and at the end of the school year. Two judges using the Singing Voice Development Measure (SVDM) rated the

taped performances. The SVDM interjudge reliability was .90 for the pretest and .99 for the posttest.

The results from Rutkowski's study suggest that individual versus group instruction does not affect children's developmental tonal aptitude. Furthermore, it appears that there is little correlation (correlations ranged from .135 to .207) between children's use of singing voice and developmental tonal aptitude.

Although the researchers above did not find clear differences in aptitude as a result of instruction, one cannot be sure whether this is a result of the choice of treatment, maturation, or the nature of music aptitude. Other researchers have found that instruction has an influence on children's developmental music aptitude, which leads one to believe that the nature of music aptitude is not the reason for the lack of significant differences.

Flohr (1981) examined the effect of short-term music instruction on fiveyear-old children's (N = 29) developmental music aptitude. The *Primary Measures of Music Audiation* was used as a pretest and posttest to assess the effects of instruction.

The children were randomly divided in one of three groups. Music-I and Music-II groups received 25 minutes of instruction for a period of 12 weeks. The instructional focus for Music-I was improvisation – question and answer games, improvising to a bordun, improvising extensions to phrases, and improvising to verbal stimuli. Music-II received the typical classroom experiences, while Music-III received no music instruction.

After 12 weeks of music instruction, children's PMMA scores in both treatment groups were significantly higher from pretest to posttest than the scores of children in the control group. This study suggests that children's developmental music aptitudes may be influenced by instruction. Due to a small sample size, Flohr was unable to draw conclusions about the effectiveness between the two types of music instruction.

In her developmental music aptitude study, Taggart (1997) investigated the effect of age-appropriate instruction on the developmental tonal and rhythm aptitudes of three- to eight-year-old children. Furthermore, she sought to determine whether this effect varied depending on the children's age and whether it would atrophy after instruction stopped.

One hundred eighty-three preschool through second grade children in atrisk schools in Lansing, Michigan comprised the sample population. The instructional period consisted of two 20-minute music classes every week taught by a music specialist for an entire school year. Children had had minimal music instruction as part of their school curriculum prior to this study. The treatment consisted of singing and chanting in a variety of tonalities and meters, tonal and rhythm pattern instruction in major and minor tonalities and duple and triple meters, and movement instruction that focused on continuous, fluid movement as well as on beat movement.

The developmental music aptitudes of the preschool children were measured pre- and post-instruction. The developmental music aptitudes of the kindergarten, first grade, and second grade children were measured prior to

instruction, immediately after instruction, and once again after a summer of having no instruction. The *Tonal* and *Rhythm* subtests of *Audie* (Gordon, 1989b) were administered to all preschool children. The *Primary Measures of Music Audiation* was administered to all children in grades K-3. Pre-instruction and post-instruction scores were compared as a measure of the children's aptitudes prior to and after music instruction. Also, in order to control for age, postinstruction music aptitude scores after a summer of no instruction were compared to pre-instruction aptitude scores of the children at the same grade level. Because a different measure (*Audie*) was used for measuring the aptitudes of preschool children than of children in grades K-3, the preschool children's scores were not considered in the comparison of differences in music aptitude between grade levels.

With the exception of the preschool children's tonal aptitude, aptitude scores after instruction were significantly higher than aptitude scores before instruction for all children, with the differences being greater the younger the children were. Developmental music aptitude scores continued to increase over the summer for children in kindergarten through grade three after a summer of no instruction. In addition, at the beginning of the next academic year, the aptitude scores of these children were significantly higher than the aptitude scores of the children the year before at the same grade level that had not received music instruction. In other words, the increase in developmental music aptitude during the summer for the children who had received music instruction the previous year was greater than the increase that could be accounted for by maturation alone.

Taggart concluded the following: (1) appropriate music instruction significantly supports the developmental music aptitudes of three- to eight-yearold children; (2) the effect of this instruction varies according to the age of the child - the younger the child is the stronger the effect of instruction; and (3) the effect of appropriate music instruction on developmental music aptitude holds over time. Providing appropriate music instruction to children as early in their lives as possible will contribute greatly to their musical potential.

A study of developmental music aptitude was conducted by Gordon (1980a) to acquire information about the comparative music aptitudes of groups of students who were of different environmental backgrounds and to further substantiate the concept of developmental music aptitude.

In the fall of 1978, *Primary Measures of Music Audiation* was administered to 167 kindergarten through third grade students enrolled in an inner-city school in Rochester, New York. The children in kindergarten received music instruction from their classroom teachers throughout the school year. First through third grade students received two periods of music instruction each week by a music specialist during the same academic year. At the end of the instructional period, two classrooms from each grade level were randomly chosen to take the *Tonal* and *Rhythm* subtests of *Primary Measures of Music Audiation*.

The means, standard deviations, and split-halves reliability coefficients for the children in the inner-city school were compared to the corresponding data from the standardization group as reported in the test manual. The children in the standardization group received significantly higher scores on the *Tonal*

subtest than did the children from the inner-city school. Statistical significance was found for every grade level. The only significant difference for the *Rhythm* subtest was found at the third grade level, with the inner-city school students receiving the higher test scores.

Gordon states that the inner-city school children may have received lower tonal aptitude scores because of their limited informal and formal music experiences. This statement is supported by the data showing a steady decline of *Tonal* subtest scores for the inner-city school children in the first, second, and third grades and a steady increase of the *Rhythm* subtest scores of the children in the first grade to the third grade. In light of the results, Gordon concludes that the concept and function of developmental music aptitude is objectively supported and the quality of music instruction is of paramount importance.

Gordon (1980b) conducted another study of developmental music aptitude in West Irondequoit, New York. In April of 1978, *Primary Measures of Music Audiation* was administered to kindergarten (n = 127), first-grade (n =202), second-grade (n = 280), and third-grade (n = 264) students enrolled in one of nine elementary schools in the city. PMMA was administered again approximately two weeks later to test for practice effects from taking the test. The differences between test and retest means were insignificant and the standard deviations were comparable. Combined with their high test-retest reliabilities (ranging from .60 to .76), the findings suggest, according to Gordon (1986) that "even for tests which yield results that are expected to fluctuate, practice effects in taking the tests are negligible and should pose no threat to the

validity of *Primary Measures of Music Audiation* or *Intermediate Measures of Music Audiation*" (p. 109).

The test results were then given to the music teachers so that they could become familiar with the scores during the summer before instruction began the following fall. The teachers used the suggestions provided in Part Six of the PMMA Manual for teaching to individual children's musical strengths and weaknesses as indicated by aptitude test scores. The music teachers then explained the test results to parents, and suggestions were offered to them for providing their children with appropriate informal home experiences and formal music instruction. Furthermore, teachers recommended that parents of children who received composite percentile ranks of 80 and above provide some kind of out-of-school special music instruction that would supplement the music instruction offered to them by their regular school program.

In April of 1979, after the children had received approximately eight months of individualized music instruction for one or two music periods each week, PMMA was administered to them for a third time. Five hundred twentythree children were still enrolled in the schools for the third administration of PMMA, and these scores where the ones used in the analysis. One year of physical and mental maturation was held constant, so that the differences in PMMA tonal, rhythm, and composite mean scores between the two groups could be attributed to the effect of instruction; the children in the control group had received traditional music instruction that was provided by teachers who had no specific knowledge of the children's developmental music aptitude test scores,

whereas the children in the experimental group had received music instruction by music specialists that was individualized based on tonal and rhythm aptitude scores. Correlations were also computed for the 1978 and 1979 PMMA scores of the children in the longitudinal group.

The results indicated that the majority of observed mean differences between the experimental and control groups of children were significant, with all differences favoring the experimental group. In addition, the differences tended to be greater for younger students and more extreme when associated with the *Rhythm* than with the *Tonal* subtest of PMMA. Gordon (1980b) acknowledges that teachers had concentrated their lesson plans more on the rhythmic activities than tonal activities. Correlations were calculated for the children's 1978 and 1979 PMMA scores. The reliabilities of the children in the experimental group were found to be considerably lower than the test-retest reliabilities computed in April of 1978. Gordon (1980b) notes that it was expected as a result of fluctuating music aptitude due to intensive exposure and instruction over an eight-month period.

The results of this study suggest the following conclusions: (1) developmental music aptitude is a reasonable concept, because scores fluctuate depending on the quality of the music instruction provided; (2) children's developmental music aptitude will develop more positively when the teacher has knowledge of the music aptitude test scores; (3) the younger the children are when music instruction is adapted to their individual music needs, the more they

will profit from it; and, (4) *Primary Measures of Music Audiation* is sensitive to developmental music aptitudes.

Summary

Many of these studies propose that music instruction influences children's developmental tonal aptitudes. Flohr (1981), Taggart (1997), and Gordon, (1980a & 1980b) and possibly Jordan-DeCarbo (1982) and Holahan (1983), found that children received higher developmental tonal aptitude scores after singing instruction. Furthermore, the younger children are when involved in appropriate music instruction, the greater the gains in developmental tonal aptitude (Taggart, 1997; Gordon, 1980b). Although Kane (1994) and Rutkowski (1986 & 1996) found that developmental tonal aptitude was unaffected by vocal instruction, this could simply be the result of an ineffective treatment. Levinowitz (1987), Lange (2000), DiBlassio (1985), and Jessup (1984) ascertained that the developmental tonal aptitude of children with low tonal aptitude increased more than those children with high tonal aptitude, only some of which can be explained by regression toward the mean. These studies give credence to the theory of developmental tonal aptitude and to the supposition that appropriate instruction increases developmental tonal aptitude.

The Effect of Instruction on Tonal Achievement

A multitude of researchers have studied children's singing abilities. Some have investigated the types of problems that are typical of children labeled as

inaccurate singers (Bentley, 1968; Davies & Roberts, 1975; Gould, 1969; Joyner, 1969). Others describe the effect of age on children's singing ability (Boardman, 1968: Brown, 1988: Clegg, 1966: Cooper, 1995: Flowers & Dunne-Sousa, 1988: Geringer, 1983; Goetze, 1986; Petzold, 1963; Sims, Moore, & Kuhn, 1982; Moore, 1994; Moore, Brotons, Fyk, & Castillo, 1997; Sinor, 1985; Smale, 1988; Yarbrough, 1991, 1992) and the effect of gender on children's singing ability (Apfelstadt, 1984; Brown, 1988; Clegg, 1966; Cooper, 1995; Goetze, 1986; Green, 1987, 1994; Jordan-DeCarbo, 1982; Joyner, 1969; Moore, 1994; Moore, Brotons, Fyk, & Castillo, 1997; Petzold, 1963; Pederson & Pederson, 1970; Phillips & Aitchison, 1997b; Rutkowski, 1986; Sinor, 1985; Smale, 1988; Stauffer, 1986; Welch, Sergeant, & White, 1995/1996). Still others examine the processes involved in accurate singing: (1) pitch monitoring (Bentley, 1969; Davies & Yelland, 1977; Goetze, 1986; Smith, 1973; Welch, 1985, 1986), (2) pitch discrimination (Apfelstadt, 1984; Bentley, 1968; Feierabend, 1984; Geringer, 1983; Pederson & Pederson, 1970; Smith, 1973; Stauffer, 1986; Zwissler, 1972), (3) vocal range (Brown, 1988; Collins, 1981; Flowers & Dunne-Sousa, 1990; Geringer, Nelson, & Kostka, 1981; Jersild, 1932; Moore, 1991; Vaughn, 1981; Welch, Sergeant, & White, 1995/1996; Welch, 1979; Wilson, 1971), and (4) group and individual singing (Joyner, 1971; Smith, 1973; Goetze, 1986; Goetze & Horii, 1989; Clayton, 1986; Smale, 1988; Green, 1994; Cooper, 1995). The branch of research involving children's singing that is most closely related to this study are those studies that have examined the effects of different types of instruction on children's singing accuracy.

Characteristics of Singing Tasks

Some of the pitches, intervals, and melodic directions involved in singing are more difficult to perform than others. Several researchers have studied the types of singing tasks that may assist or impede children's vocal achievement. The discussion in this section is limited to studies that focus on vocal instruction that occurs over an extended period of time, as that is the focus of the current study. Studies that involve a single session followed by the testing of children's singing will not be included.

Jones (1971) hypothesized that a vertically arranged keyboard instrument, manipulated by children, would be an effective means of improving the auralvocal performance of uncertain singers. Eight children in the second and third grade (two boys and two girls from each grade level) were selected to serve as subjects. The music teachers recommended a number of children based on their having average music abilities and difficulties with singing. The recommended students were then given a screening test consisting of twenty pitches. Children considered for the study were the ones who correctly matched fewer than five pitches.

A test of aural-vocal skills was administered individually to each child prior to instruction and once again at the end of instruction. The aural tasks included the identification of the number of pitches heard, identification of whether pitches were the same or different, and identification of the higher of two pitches. The vocal tasks consisted of matching a single tone and matching tonal patterns. The vocal portions of the test were tape-recorded and the aural portions were

notated in written form. The children's performances on the pre-test were used as a means of classifying their skill level according to a set of predetermined levels of ability. This information formed the foundation of a practice plan for individual children to help them achieve the next level of ability. The researcher kept a cumulative record for each child, noting the progress of the daily sessions. Each child received a total of four hours of private music instruction. The instruction was divided into sixteen 15-minute sessions throughout a four-week period. The sessions were designed to follow a set of sequential steps that moved the children from one level of singing ability to another.

The Magnus electric reed organ was used for developing vocal skills. The pitches falling within the range of children's voices were labeled with various colors and corresponding pitch names, so children without keyboard experience could manipulate the instrument. A light was installed on the bottom of the keyboard to indicate to the children that their singing was accurate.

Each instructional period was designed to follow sequential steps in the levels of singing ability. The steps consisted of the following: (1) distinguishing the difference between extreme high and low pitches through the spatial relationships that were kinesthetically experienced on the keyboard; (2) distinguishing the difference between high and low pitches within one octave; (3) matching a single pitch; and (4) matching two or three consecutive tones. After singing with the instrument, the children sang after the instrument and were then asked to state if their singing matched. The light attached to the bottom of the

keyboard was used at this point in the sequence to inform the children whether their singing was accurate.

Songs were taught to the children as soon as they could sing a series of pitches. Three pitch songs incorporating intervals of a second were introduced first. The song range gradually expanded to include intervals of a minor third, major third, and a fourth. Near the end of the study, children were asked to play the starting pitch of a familiar song using the "silent keyboard." As the children sang the song, they were asked to follow the notes on the keyboard.

The results directly related to vocal achievement show that there were gains in the children's pitch matching scores from pretest to posttest. It is not indicated whether these gains were statistically significant. Jones concludes that having children play isolated pitches or patterns on the vertical keyboard prior to singing intensifies concentration on the sound or sounds and, in turn, increases vocal accuracy. In addition, Jones found that children were more successful singing melodic patterns and songs than single tones or scales. This is important to consider when designing singing tasks that involve young children. Since children's singing may be more accurate when performing songs rather than single pitches or scales, the post-instructional testing procedures for the present study will include song performance.

Jarjisian (1983) examined the effects of singing instruction using pentatonic and diatonic patterns on the rote singing achievement of young children. The participants in this study were three intact first grade classes in

each of two elementary schools in Philadelphia. The schools differed with respect to socio-economic status, teachers, and amount of instructional time.

The children in one school received 45 minutes of music instruction once per week during a four-month period. The other school received two 30-minute periods of music instruction per week for four months. Each of the three classes in both schools was designated as T1 (diatonic pitch pattern instruction), T2 (pentatonic pitch pattern instruction), or T3 (a combination of diatonic and pentatonic pitch pattern instruction). Ten to fourteen minutes were dedicated to pattern instruction each week. The remaining class time included singing rote songs, rhythm activities, listening activities, and movement activities.

Four criterion songs (two diatonic and two pentatonic) were taught to the children during the last month of the treatment period. Jarjisian did not indicate the tonality of the two diatonic songs. Each child performed the four songs individually, without accompaniment. The performances were tape-recorded and then rated by two independent judges. The children's level of singing achievement was determined through a five-point continuous rating scale. The interjudge reliabilities ranged from .72 to .86.

Analysis of the data revealed that the T3 group received significantly higher mean scores than did the T1 and T2 groups. There was no significant difference between the T1 and T2 groups. Children in first grade receiving a combination of diatonic and pentatonic pitch pattern instruction showed higher levels of singing achievement than children who received only diatonic or pentatonic pitch pattern instruction. Jarjisian concludes the following: (1) diatonic

pattern instruction aids the development of a sense of tonal center; (2) pentatonic pattern instruction contributes to in-tune singing or a sense of melodic contour; and (3) a combination of the two types of pattern instruction offers children the best of both methods.

Text Versus No Text

Do children learn to sing more accurately when song instruction includes text or when it does not? Gordon (1997c) states that the text serves as a diversion from music learning. When a song is taught using words, students concentrate on the text of the song rather than on audiating tonal patterns, rhythm patterns, tonality, and meter (Gordon, 1997a). Furthermore, inaccurate singers may be inclined to use their speaking voice when words are used. Learning songs with text may be difficult for young children, so Gordon recommends that text be added only after children can accurately perform the melody of a song. Andress (1986) also questions if the distraction of words is a factor in the young child's inability to accurately perform the melodic and rhythmic aspects of a song.

Goetze (1986), Smale (1988), and Welch, Sergeant, & White, (1995/1996), examined the effect of songs with text and songs without text on children's vocal accuracy. Goetze and Smale found no significant difference in children's pitch accuracy when singing a song with text or without text. Welch, Sergeant, & White found that children were more accurate when singing songs without text. Goetze, Smale, and Welch, Sergeant, & White did not investigate

the effect of song instruction on singing achievement and, therefore, will not be discussed in depth in this discussion. The following studies (Richner, 1976; Levinowitz, 1987; Lange, 2000; Kane, 1994) examine the effect of song instruction with and without text on the tonal achievement of young children and, therefore, will be included in the discussion.

Richner (1976) investigated the effects of various methods of music instruction on the singing ability of inaccurate singers in grades three, four, and five. Eight hundred forty-three students from four different elementary schools within the same school district were screened to determine which students were inaccurate singers. The initial selection of inaccurate singers was made based on the student's ability to sing familiar songs within a group. From the initial screening process, 287 students were labeled as inaccurate singers. Students from each grade level were randomly selected from the list of 287 students to participate in the second part of the screening process. These students were interviewed and asked to sing familiar songs individually. Eighty-two students were found to be inaccurate singers in both group and individual contexts. Due to a variety of reasons, the final sample for the study consisted of 77 students (27 in third-grade; 23 in fourth-grade; 27 in fifth-grade).

One of four treatments was randomly assigned to four different schools. Students in the Treatment I group received no formal music instruction. However, the classroom teachers did provide informal music experiences as usual. Students in the Treatment II group were taught by a music specialist and received two 25-minute periods of music instruction per week for eight weeks.

These students remained with their intact classes for music instruction. The inaccurate singers in this group did not receive individualized instruction. Instruction for this group included rhythm activities, singing, instrumental performance, note reading, listening, and creative activities.

Students in the Treatment III and Treatment IV groups were also taught by a music specialist and received two 25-minute periods of music instruction per week for eight weeks. The inaccurate singers in these two treatment groups also received music instruction with accurate singers in groups of 10 selected from each grade level. This was to insure that inaccurate singers were not placed in a situation that could lead to poor self-concepts. The group size was kept to a maximum of 10 in order to allow time for individual instruction.

Music instruction for Treatment III consisted entirely of singing songs with text. The inaccurate singers sang only within the group; they were not asked to sing individually and received no special attention. Music instruction for Treatment IV included 20 minutes of remedial vocal training for the group and individuals. Students were instructed on producing accurate single pitches within the range necessary for a given song. When this was accomplished, students were taught songs that contained stepwise patterns, followed by songs that contained skipping patterns. All songs were sung without text. The remaining five minutes of each class period was used to sing songs (with text) for "enjoyment."

Richner developed a 55-item "Pitch Reproduction Test" to measure the student's singing accuracy prior to and after instruction. Part I tested the

student's ability to accurately reproduce one pitch at a time. Part II and III measured the student's ability to accurately sing melodic phrases. Both parts of the test were divided into an A and B section. The A sections measured the pitch accuracy while singing melodic phrases without text. The B sections measured the pitch accuracy while singing melodic phrases with text. The strobotuner, an electronic device that indicates degrees of pitch accuracy, was used in order to "eliminate the need for subjective judgment about pitch accuracy" (p. 35).

An independent music specialist administered the test to each individual child. Using the strobotuner, the test administrator rated the children's singing (individual pitches and individual pitches within each melodic phrase) as either a match or a no-match. Richner reported reliability for the "Pitch Reproduction Test" as .97.

Significant differences did exist between the treatment groups at the fifthgrade level and at the third-grade level. There were no significant differences between treatment groups at the fourth-grade level. The pitch accuracy of fifthgrade inaccurate singers in the Treatment IV group improved significantly in comparison with the other treatment groups. The pitch accuracy of third-grade inaccurate singers in the Treatment III and IV groups improved significantly in comparison with students in the Treatment I group.

The students in the Treatment I group received significantly higher mean scores when singing melodic phrases without text than when singing with text. In addition, when the total sample was considered, students received significantly higher mean scores when singing using a neutral syllable. Inaccurate singers

who received song instruction without text (Treatment IV) showed significant improvement in their ability to sing melodic phrases without text when compared to inaccurate singers in Treatment I and III groups. Inaccurate singers who received song instruction without text (Treatment IV) showed significant improvement in their ability to sing melodic phrases with text in comparison to all other treatment groups. It is important to note that Treatment IV group received individual attention, and, therefore, one cannot be sure if the results were due to the effect of text/no text or to individualized instruction.

Levinowitz (1987) examined, in part, the effects of song instruction with words and without words on the singing achievement of children in kindergarten and first grade. The children were randomly assigned to one of three treatment groups: (1) songs primarily with words, (2) songs primarily without words, and (3) songs always with words. She composed two criterion songs, one in major and one in minor, so that the songs would be unfamiliar to the children. Levinowitz created a tonal rating scale to rate the children on the use of singing voice, accuracy of intonation, and ability to perform the resting tone in the context of a song. The results of this study show no significant difference in singing achievement when instruction includes the use of songs with words or songs without words.

Lange (2000) also investigated the effect of the use of text in music instruction on the tonal accuracy of kindergarten students. Two classes (one from each of 2 schools) were randomly selected to receive song instruction
primarily with text for a period of 24 weeks. During the same 24 weeks, the remaining two classes received song instruction primarily without text.

Lange selected a major/duple criterion song and a dorian/duple criterion song from the folk literature. The tonal accuracy of the children's performances was rated using a five-point continuous researcher-designed rating scale. Lange's results concur with those of Levinowitz (1987) that song instruction with words verses song instruction without words made no difference in children's tonal accuracy when singing.

A portion of Kane's study (1994), not discussed in the previous section, examined the effects of tonal pattern and song instruction on the singing achievement of kindergarten children. She was specifically interested in the difference between instruction that included the singing of tonal patterns and songs without words in a variety of tonalities and meters and instruction that included the traditional teaching of rote songs with words in major and harmonic minor and duple and triple meters.

At the conclusion of the instructional period, each child individually sang two criterion songs, one in major tonality and triple meter and one in harmonic minor tonality and duple meter. Both the experimental and control groups sang the same songs, with the exception that the experimental group sang without words and the control group sang with words. Both criterion songs were performed twice, once with melodic accompaniment and singing by Kane and once individually. A total of four performances were tape recorded and used for analysis.

Two independent judges evaluated the children's singing achievement using a five-point continuous rating scale. Interjudge reliabilities ranged from .79 to .83. Although not statistically significant, the experimental group received a slightly higher singing achievement mean score for both of the accompanied songs and for both of the unaccompanied songs. Kane suggests this may be the result of the classroom teachers singing songs with words to the children outside of the "music class." The control group had many more opportunities during the day to sing songs with words, whereas the experimental group received only 10 minutes of song instruction without words each day. In addition, the criterion measures are questionable, in that one group sang with text and one group sang without text. It seems the discrepancy between singing tasks would render the results meaningless. Therefore, the results of this study should be viewed with caution.

Summary

Three of these studies (Levinowitz, 1987; Lange, 2000; Kane, 1994) found no difference in the tonal achievement of children resulting from whether instruction included the use of text. Conversely, Richner (1976) found that vocal accuracy increased as a result of the absence of text in instruction. Goetze, Cooper, & Brown (1990) remark that "there is insufficient evidence to conclude whether children sing more accurately with or without text. The inconsistency of findings suggests that more research is appropriate" (p. 32). While the present study does not include an inquiry into the effect of text on children's vocal

accuracy, it will incorporate the following: (1) all songs will be taught initially without text throughout the treatment period; (2) text will be included after children have learned to sing the melody and only when the text is a necessary component of the song; (3) the criterion songs will be sung without text; and (4) the Tonal Rating Scale (Levinowitz, 1987) will be used as a model to rate the children's song performances. Levinowitz reported high interjudge reliabilities (r = .89 and .94) for the rating scale, and it most closely relates to the needs of the present study.

Effect of Instruction on Improvisation

Improvising and composing are important means for learning and knowing music (National Standards for Arts Education, 1994; Sherman, 1971). Both improvisation and composition inform a teacher about a student's level of musical understanding. The type of instruction children receive may be a key factor in developing the skills and cognitive understanding needed in order to improvise and compose in meaningful ways. Although composition is an important component of the music experience, it lies outside the realm of the present study and, therefore, will not be included in the discussion. For the purpose of this study of young children, this study of related literature will focus only on research involving the effects of instruction on improvisation.

Joseph (1983) sought to determine if a kindergarten music program based on Dalcroze Eurhythmics would develop children's instrumental improvisational

skills. She proposed that children receiving improvisation instruction would outperform children who did not receive improvisation instruction.

Fifty-seven kindergarten children from two private schools served as subjects. The design of the study consisted of two primary groups - children receiving Eurhythmics instruction (experimental group) and those who did not (control group). In addition, half of the children (Experimental Group I) received Eurhythmics with chanting and instrumental improvisation instruction while the other half (Experimental Group II) received Eurhythmics without chanting and instrumental improvisation instruction and instrumental improvisation instruction. The instructional period was one school year. Joseph taught two 25-minute music classes for each of the experimental groups two times per week. A classroom teacher with a Bachelor's Degree in music taught the control group (Group III). The control group's music classes were not scheduled as a specific class time but instead were integrated into the school day. Music activities for this group included singing with guitar accompaniment, listening to records, and movement.

Joseph designed the Test of Kindergarten Child's Aptitude for Music/Movement Improvisation as a pretest/posttest measure. However, unforeseen circumstances required that she change the design, and therefore she used the test at the end of instruction only. The test was divided into three sections. The first section measured the child's ability to discriminate between and physically respond to same and different visual stimuli. In the second section, children were asked to respond with large body movements to music to determine if the children could coordinate movement with music. The tasks in

the third section involved the repeating and creating of patterns while maintaining a steady tempo. The children were asked to perform the patterns by chanting, clapping, and playing a drum. For the final item in section three, children were asked to improvise feely on a set of chromatic bells in order to determine if the concept of pattern would be transferred to performance on the instrument. The test was administered to 30 individual children (ten children randomly selected from each group).

From the results of Joseph's study (1983), it appears that children who received Eurhythmics training were more adept at recognizing, associating movement with, and responding to familiar patterns in unfamiliar music than those children who did not receive such training. Furthermore, children receiving Eurhythmics training with improvisation outperformed children not receiving improvisation in their use of patterns when freely improvising on a set of chromatic bells. It is also possible that Joseph's findings are the result of instruction given by two different teachers rather than as a result of treatment. Joseph taught the experimental group, whereas a musically trained classroom teacher taught the control group. The results would have more meaning had both teachers taught an experimental and control group.

Partchey (1974) examined the effects of three learning strategies on the ability of sixth-grade students (N=86) to improvise melodies. Students were randomly assigned to one of three groups: 1) Delayed feedback (n = 30) - students immediately heard a replay of their improvisation before improvising the second time; 2) Precomposed models (n = 28) - students heard a correct

response in expectation that it may positively influence subsequent improvisations, and; 3) Repetition or control group (n = 28) - students received the same number of opportunities to improvise but did not experience one of the two experimental strategies. This group served as the control for the effect of practice on the pretest/posttest scores.

Each student was pretested prior to instruction and then tested after instruction. During the three-session instructional period, individual students were given equal opportunities to improvise on an alto or tenor xylophone to prerecorded piano accompaniments. The tonalities of the accompaniments were pentatonic, diatonic, minor blues, and whole tone - tonalities that contained few leading tones. Accompaniment styles were jazz, rock, and blues. The accompaniments were played first for the student to listen to before improvising the first and third times; the second improvisation introduced the experimental variable.

The pretest and posttest scores in this study were a measure of melodic improvisational ability designed by Partchey specifically for the experiment. Partchey's two main criteria for judgment of the quality of the improvisations were performance and creativity.

The primary performance criterion Partchey used was duration, having to do with the subject's ability to perform with the pulse of the stimulus and the creation of clearly identifiable rhythm patterns. The two creativity criteria Partchey used were variety and unity. The variety element of the improvisations was examined in terms of tonal and rhythm contrast; the ability to generate these

features was taken as a measure of creativity. The unity element of the improvisations was examined in terms of phrasing, repetition, imitation, and pitch direction used by the student.

The criteria were numerically rated by three judges on a scale of 1 (weakest) to 9 (strongest). These scores were acquired for performance, creativity, and the combination of performance-creativity. Interjudge reliabilities were determined to be .91 or above for each set of scores.

A repeated-measures ANOVA was conducted to determine if any differences existed between the groups. There were no significant pretest/posttest mean score gains between the groups. Statistically significant pretest/posttest differences occurred between all groups in the creativity and performance-creativity combined scores. In spite of these results, the Group 1 feedback strategy appeared to be slightly more effective at developing creativity than the other two strategies. Partchey partially attributed this to the affective responses generated by the students upon hearing their own improvisations played back for them. Thirty-nine percent of the students did not benefit from the learning strategies – they experienced no gain or losses in the mean pretestposttest score. Partchey states that this may be due to factors of motivation, interest, and awareness of the experimental procedures.

Overall, Partchey concluded that all three strategies do induce some measure of learning as manifested in the ability to improvise melodies. All three strategies improved improvisational ability. Partchey also concludes that creativity scores could improve independently of the performance skills.

Wig (1981) examined the viability of music composition strategies in teaching sixth- and eighth-grade band students' (N = 28) to improvise. In addition, Wig examined the relationship between improvisation ability and two other variables, performing ability and academic achievement. Students were tested prior to and after instruction with The *Watkins-Famum Performance Scale* and the Measure of Melodic Improvisation Ability. Students were administered the *SRA Achievement Series* (a measure of academic achievement) by the school district prior to instruction. The students received instruction in music composition strategies for a seven-week period, one 50-minute session per week. The compositional strategies included retrograde, inversion, retrograde inversion, and embellishment of melodies. As part of his Measure of Melodic Improvisation Ability, Wig asked subjects first to create a short song, about 10 seconds in length, and to think of two ways to vary it. They were to vary their melodies in one of four ways taught to them in the composition lessons.

The improvisations were rated from one through five on four criteria creative use of pitch, creative use of intensity, creative use of duration, creative use of form. Interjudge reliabilities among the three judges were .80, and intrajudge reliabilities for two judges were .92 and .94 for the composite scores.

Results showed that significant gains were made in improvisation ratings after the composition instruction. No relationship was found between the improvisation gain scores and performing skill or between the improvisation gain scores and academic achievement.

Amchin (1995) investigated the effects of teacher/student verbal interactions on the improvisations of fourth- and fifth-grade students (N = 129). He sought to "measure whether exposure to improvisation activities found in the Orff-Schulwerk along with teacher-student interactions designed to help children evaluate their creative responses influences children to produce more musical improvisations" (p. 8). Specific problems included measuring the significant differences 1) among mean scores on Webster's Measure of Creative Thinking in Music, Version 2 between children who had teacher-led discussions about their improvisations and those children who did not; 2) among means scores on the Measure of Instrumental Creative Musical Response (measure of improvisational abilities) between the two groups of students; 3) among mean scores on Intermediate Measures of Music Audiation between the two groups of students, and; 4) in adjusted mean scores for the test of creative musical thinking and improvisational abilities, adjusting using music aptitude mean scores as the covariate.

Students from six intact classrooms from four different schools participated in the study. The classes were randomly assigned to either the control (n = 65) or experimental group (n = 64). The instructional period consisted of 15-minute treatments twice a week for 23 weeks. Students in the control and experimental groups were similar with respect to gender, *Cognitive Abilities Test* scores, grade, musical background, interest in music, participation in musical activities, and music aptitude.

Two activities occurred during each instructional session. The first activity consisted of a warm-up imitation game using melodic selections from the Orff-Schulwerk. The selections used during the first seven weeks of instruction were in duple meter. Melodies in triple meter were used during the next seven weeks of the instructional period. Rote melodies in compound meter were used during the third seven-week period. Selected melodies in duple and triple meter were used during the triple meter were used during the remaining weeks of the study. The warm-up activities included body percussion, vocal imitation, and beat accompaniment while learning each selection. The students then performed the rote melodies on xylophones following the teacher's model.

The second activity in each of the instructional sessions was the melodycompletion task. An antecedent-consequence phrase was performed for the students. Individual students were then asked to create their own consequent phrase following the original model. Students in the experimental group were then asked specific questions: "What is the difference between the model I gave to you and your ending?," "How is yours alike or different from the one I played for you?," and "Can you think of another ending?" (p. 152). Finally, students were given an opportunity to improvise a second ending. Questions were not addressed to students in the control group prior to their second improvised ending.

Webster's Measure of Creative Thinking in Music, Version 2 (measure of creative musical thinking) and Intermediate Measures of Music Audiation (measure of music aptitude) were used as pretest/posttest measures. Froseth's

How I Feel About Music (HIFAM) survey and the *Cognitive Abilities Test* (CAT) were administered in the pretest phase of the study. The Post-Treatment Survey-2 (PTS-2) and the Measure of Instrumental Creative Musical Response (measure of improvisation ability) were administered during the posttest phase of the study.

Results indicated no significant difference in means scores on the MCTM-II, MICMR, and IMMA between the experimental and control groups. Also, there were no significant differences in MCTM-II and MICMR scores after using IMMA as a covariate.

Kalmer and Balasko (1987) examined the improvised songs of Hungarian preschool children (N = 30) to determine if the music they were learning in their classes created a musical vocabulary (referred to as "mother tongue") that was reflected in their improvisations. The children were from two nursery schools (school A and school B) in Budapest, Hungary. Children were divided into three groups as follows: (1) group A-m (n = 10), attended the school's regular music program and in addition participated in two additional 30-minute music periods of "special playful singing-music activities" (p.79) that was organized in a "very systematic and expert way" (p. 79); (2) group A-c (n = 10), the control group, participated in the regular nursery school music activities only, and (3) group B (n= 10), was taught by a "teacher with a remarkably creative personality, where music constituted an integral part of everyday classroom life" (p. 79).

All children were taught two counting rhymes (one with meaningful text and one with a nonsense text) that could be recited in duple meter. Individual

children were then asked to sing the rhymes as songs, beginning first with the nonsense text. The children created different melodies until they said they did not want to did not want to create any more. The same procedure was repeated for the meaningful text.

A total of 169 improvisations were recorded and analyzed. Improvisations using familiar melodies were excluded from the analysis. All of the children were able to create more than one melody. On the average, children improvised 5.6 melodies.

Results indicate that the children in group B significantly outperformed the other groups in nearly all areas. This group produced the most improvisations, their melodies include the largest range of pitches, the largest intervals, and the largest variety of tonalities. The children in group A-m were more careful in performing their improvisations – "rules of the learned music material are adhered to more stringently" (p. 80). Group A-m was the only group to improvise complete melodies using the pentatonic scale. The poorest performance in the application of learned rules and elements and creative productivity was by group A-c.

The study was still in progress when the article was printed, and only fluency and originality had been examined as measures of creativity. Fluency was measured in terms of the number of responses given by a child; group B had far higher fluency scores than the other two groups. Originality scores were given for elements or features in the improvisations that were rare or novel in nature. Group A-m's mean originality score was five times higher than group A-

c's mean originality score; group B's mean score was three times higher than that of group A-m.

Kalmer and Balasko suggest that the "musical mother tongue" (p.83) does exist. Typical features of the Hungarian folk songs (volume, tonality, intervals, structure, phrases, rhythm patterns) were identifiable in the children's improvisations. The authors concluded that "the most favorable condition for fostering the children's elementary music creativity is when the permanent teacher of a group is musically well-trained and at the same time has a creative personality" (p. 83). The results must be viewed with caution due to the small number of participants in the study.

Summary

Although Amchin (1995) found that instruction did not affect children's improvisations, Joseph (1983), Kalmer & Balasko (1987), Partchey (1974), and Wig (1981) found that it did. As a result of instruction, young children can (1) improvise tonal patterns (Joseph, 1983; Kalmer & Balasko, 1987), (2) improvise music that incorporates musical structures (Kalmer & Balasko, 1987), and (3) can maintain a steady beat and meter (Kalmer & Balasko, 1987). Different learning environments (Kalmer & Balasko, 1987), learning strategies (Partchey, 1974) and composition instruction (Wig, 1981) can improve improvisational abilities.

Aside from the study of Kalmer and Balasko (1987), there is no research on the affect of instruction on the vocal improvisations of young children. When a child improvises vocally, one can be confident of the degree to which an

individual has internalized a music vocabulary, understands, and is able to expresses intended musical ideas.

When a child improvises on an instrument, one cannot be completely sure if the improvisation is a result of understanding or of luck in selecting the correct pitches. More research is needed on the effects of instruction on children's vocal improvisations. Therefore, it is the intent of this researcher to incorporate this element into the present study.

The Effect of Harmonic Accompaniment on Tonal Achievement

"Mainwaring (1951) feels that the primary concern when working with children should be to awaken an interest in the aural effects of sounds heard simultaneously and presented in musical combinations. The use of simple polyphonic music can serve to develop concepts of consonance, dissonance, and resolution which then serve as a basis for examining the qualities of chords and chord progressions" (Petzold, 1966, p. 146). What is the role of harmony for inexperienced young singers? Does the addition of harmony help or hinder the development of singing achievement? Some studies have examined children's auditory perception of harmony (Berke, 2000; Bridges, 1966; Costa-Giomi, 1992; Ritchie, 1962). The present study is interested in only those studies that have to do with the effect of harmonic accompaniment on children's tonal achievement.

Sterling (1985) investigated the development of harmonic perception. Sterling also examined the effects of three different harmonic contexts on children's simultaneous singing of familiar melodies. The harmonic contexts

were (1) melodic replication (no harmony – melody played one octave above child's singing voice), (2) traditional tonal harmony (diatonic chords with simple progressions), (3) chromatic harmony (chromatic, altered, extensions, modulations), and (4) dissonant harmony (nondiatonic chords). The specifics of Sterling's study were to determine if differences existed in the vocal pitch accuracy of children based on (1) grade level, (2) varied types of harmonic accompaniment, and (3) dissimilar melodies (differences in pitch range and rhythmic simplicity).

One hundred children in first, third, fifth, and seventh grades (25 children in each grade level) participated in the study. Children were randomly selected from a pool of children that were preselected on the basis that they could accurately sing (without accompaniment) "Jingle Bells," "Twinkle, Twinkle Little Star," and "Old MacDonald." Sterling wanted to use songs with which children were already familiar, as there was no instructional component to her study.

Each child met with Sterling individually for testing. Data collection was divided into two parts for each of the three test melodies. In Part I, children sang the melody accompanied only by the melodic reference tape. They were allowed at least two attempts to achieve a score of 35 as measured by the Pitch Master but were limited to five attempts. The Pitch Master compares vocally-produced pitches to those on a prerecorded reference tape. Any child that could not attain the minimum score of 35 was eliminated from the study. Children who scored higher then 35 on their first effort were asked to sing again, and the highest of the two scores was recorded. Part II consisted of children individually singing each

of the three familiar songs with the various types of accompaniment (12 performances per student).

All of the children's performances were recorded using the Pitch Master device. The deviations from the model were measured, and the total number of pitches that matched was counted and used to indicate the level of vocal pitch accuracy. In order to control for the effect of position, Sterling alternated the presentation order of the performances of melodies and harmonic accompaniment.

The results of this study suggest that harmonic perception improves with age. There was a significant difference in mean scores between children in first and third grades, with third-grade children receiving the higher scores. The mean scores were not significantly different for children in grades five, and seven. However, children in seventh and fifth grade scored significantly higher than children in third grade.

The type of accompaniment had a significant effect on the children's vocal pitch accuracy. For each grade level, children scored significantly higher when singing with the melodic reproduction and traditional accompaniments than when singing with the chromatic and dissonant accompaniments. In addition, children were singing with the melodic reproduction accompaniment scored significantly higher than when singing with the traditional accompaniment. There was no significant difference in scores between the chromatic and dissonant harmonic accompaniments.

Finally, the nature of the melody had a significant affect on the vocal performance scores, regardless of the type of accompaniment. Children's vocal pitch accuracy scores were significantly higher on "Old MacDonald" than for the other two songs. "Twinkle" had lower mean scores than "Old MacDonald" and was a little more difficult for the children to sing. The children received the lowest mean score for "Jingle Bells."

Although this study addresses a much-needed area of music research, the results must be approached with caution. Sterling used children's vocal accuracy as a measure of their harmonic perception. This may be a problem, since there is little correlation between children's use of singing voice and developmental tonal aptitude (Rutkowski, 1996). Sterling assumes that vocal accuracy is an indication that children comprehend the sounds that they hear. She neglects to address the fact that some children can sing accurately because they are good imitators. Singing accuracy does not necessarily mean that one audiates well. Using a valid aptitude test as an additional criterion measure may have been useful.

The purpose of Kimble's study (1984) was to consider the ability of children to sing an added part. Specifically, Kimble compared the vocal accuracy of children singing with a countermelody to their singing with a homorhythmic part. Furthermore, the effect of order of presentation of the added parts was also examined.

Seventy-six fourth-grade and 73 fifth-grade students (N = 149) who met a minimum criterion level for unison singing served as subjects. Students who met

the criteria were administered the *Tonal Imagery* subtest (melody and harmony) of *Music Aptitude Profile* and the *Otis-Lennon School Ability Test* (IQ test). The students were assigned to one of four treatment groups that were balanced in terms of gender and singing ability. Two groups of students received melody pre-training, and two groups of students received general song practice pre-training during the first four days of the study. All students received training in singing the two added parts (countermelody and homorhythmic part) and were tested on both. To control for order of presentation of the harmonic arrangement, the treatments were counterbalanced across groups.

The daily treatment sessions were five minutes long and spanned over a three-week period. During the first four days of week two and week three, students learned the added parts in a rote manner, unaccompanied, using the syllable "doo." On the fifth day of week two and week three, each student was individually recorded singing the added part with a pre-recorded tape of children singing the melody and the added part. Kimble reviewed the melody with the students prior to the testing. The student was asked to sing the added part two times for the recording. Three judges rated the recordings using a 7-point rating scale of pitch accuracy. The higher of the two recording scores was used for analysis.

Differences between the countermelody scores and the homorhythmic scores were analyzed using a paired *t* test. The homorhythmic scores were found to be significantly higher than the countermelody scores. Kimble found that melody pre-training made no difference in the pitch accuracy scores of

students. Students who did not receive pre-training received the same scores as students who did receive pre-training. She also found that the presentation order of added parts made no difference in student's vocal pitch accuracy. In addition, fourth- and fifth-grade students were equal in their ability to accurately sing a melody with an added part.

No significant correlations were found between scores of pitch accuracy in singing a (1) countermelody and scores of aural discrimination, (2) a homorhythmic part and scores of aural discrimination, (3) countermelody and intelligence scores, and (4) a homorhythmic part and intelligence scores. Pitch accuracy scores were correlated with (1) *Melody* MAP scores, (2) *Harmony* MAP scores, and (3) school IQ scores. The countermelody scores were significantly correlated with *Harmony* MAP scores in three of the four instructional groups, and no significant correlations were found with the IQ test.

English (1985) investigated the effect of the amount of piano accompaniment in beginning strings class instruction on the students' intonation and rhythmic stability. Although this study does not directly relate to children's singing, it does relate to children's aural skills, their performance on an instrument, and harmonic accompaniment.

Sixth-grade beginning strings students (N = 42) were randomly assigned to one of three treatment groups, each receiving varying amounts of piano accompaniment. The three treatment groups were as follows: (1) no piano accompaniment; (2) 100% of instructional time with piano accompaniment; and (3) 50% of instructional time with piano accompaniment.

In order to assess if equal amounts of musical ability existed between the three treatment groups, English administered the *Musical Aptitude Profile* (MAP). English constructed a posttest measure, the String Performance Adjudication Profile (SPAP), for use in the evaluation of the children's instrumental performances. SPAP scores encompassed four areas: (1) group-prepared individual intonation; (2) group-prepared individual rhythmic consistency and accuracy; (3) individual sight-reading intonation; and (4) individual sight-reading rhythmic consistency and accuracy. Each individual child's instrumental performance was taped and then rated by three judges.

The results for the pretest showed that the group receiving no piano accompaniment scored significantly higher on MAP prior to treatment than the other two treatment groups. This indicates that the music aptitudes of the three groups were unequal at the start of the treatment period, and therefore one group may have had an advantage when achievement testing occurred. It is unfortunate that the groups could not be divided so that each group had equal levels of music aptitude between them. Had this happened, the results of the study would have more meaning.

The no piano accompaniment group scored significantly higher on each of the four posttest variables than the other two treatment groups. The group of students who had piano accompaniment 100 percent of the instructional time had the lowest MAP scores and the lowest performance achievement scores on three of the posttest variables. The one exception was the variable of prepared

rhythmic consistency and accuracy, for which the piano accompaniment groups received relatively the same score.

Unfortunately, because there were significant differences between groups prior to treatment, the results of this study must be viewed with caution. As expected, the group of children with the highest music aptitudes was also the group of children who had significantly higher performance ratings than the other two groups. English neglected to do analysis of covariance to eliminate the aptitude differences and, as a result, "It is unclear whether the group with no piano accompaniment made higher posttest scores due to the treatment of musical aptitude (this class made the highest score on the MAP pretest). It is hoped that this study will provide impetus to future researchers to clarify these issues" (p. 77).

Atterbury and Silcox (1993) examined the effect of piano harmonic accompaniment on the singing ability of kindergarten children. The children were divided into two groups. One group of children (n = 96) received all of their singing instruction with piano accompaniment. The other group (n = 109) received all of their singing instruction without piano accompaniment. The researchers also examined the differences in singing ability that might occur between low, average, and high music aptitude students, as well as the effect that harmonic accompaniment might have on developmental music aptitude.

A pretest-posttest design with an additional posttest was used. A four phrase, AABA song was taught to all of the children during the first three weeks of the school year. Each child was taped performing the song individually at the

end of the three-week period and then again during the first week in June. The children's song performances were rated using a 4-point continuous rating scale adapted from the scale developed by Rutkowski (1986). Interjudge reliabilities for the pretest and posttest were .747 and .859 respectively. In addition, the *Tonal* and *Rhythm* subtests of *Primary Measure of Music Audiation* (PMMA) (Gordon, 1979) were given to the children during the last weeks in May, and the composite score was used in the analysis. The researchers attempted to administer PMMA at the beginning of the school year and found that the children were not developmentally ready to take such a test.

After one year of instruction, Atterbury and Silcox found no significant difference between the treatment and control groups on song performance scores. However, as would be expected, there was significant difference in song performance between the three aptitude levels. Children with high developmental music aptitudes received higher song performance mean scores than children with average and low levels of aptitude. Also, the song performance composite scores for children who had singing instruction with piano accompaniment were approximately the same as children who received singing instruction without piano accompaniment. The harmonic context did not affect developmental music aptitude.

Atterbury and Silcox point out that the narrow range of their rating scale may account for the lack of statistical differences in the analysis. They suggest that this scale should be expanded for future use so that the measure is more specific. They also suggest that a more accurate scoring system might be one

that focuses on specific phrases of a song instead of rating the entire song. They conclude with a strong recommendation for future research to investigate the effect of harmonic accompaniment on children's singing.

Petzold (1966) was concerned with the relationships that may exist between the accuracy with which children perceive and reproduce melodic fragments when presented within varying harmonic contexts. He believed that the key to accurate singing was the ability to perceive and retain the resting tone of a tonality. Petzold also believed that "traditional" harmonic accompaniment might serve as an invaluable aid to accurate singing. "Not only do the chords themselves reflect the harmonic implications of the melodic line but they provide the tonality, thus reinforcing the singers' awareness of the tonal center of a given song" (p. 147).

This discussion of Petzold's study will be limited to his two research questions that directly relate to the present study. The first question addresses harmonic accompaniment and its effect on the accurate reproduction of a melodic line. The second relates to the varying degrees of harmonic accompaniment and their effects on children's singing.

Children (N = 360) in grades one through six participated in this study. Ten melodic fragments from a 45-item test developed by Petzold were selected based on item difficulty analysis – items selected were of medium and above average difficulty. The selected items were used in the construction of the Harmony Test, which measured children's vocal accuracy. The 10 melodic fragments were presented within the context of three harmonic treatments. The

three types of harmonic accompaniment used were (1) a single chord that was sustained throughout the entire melodic fragment, (2) primary chords within simple chord progressions, and (3) secondary chords, inversions, and moving bass, alto and/or tenor lines within complex chord progressions that changed with each pitch of the melodic fragment.

Three forms of the 40-item Harmony Test were then used to examine the effect of harmonic accompaniment on the accurate reproduction of a melodic line. The child's task with Form A involved listening to the simultaneous presentation of the melodic fragment and harmonic accompaniment (tape recording with the piano as the performing medium) and then immediately echoing that melody in conjunction with the harmonic accompaniment exclusive of melody. Form B was analogous to Form A, with the exception that the child's response was unaccompanied. Form C was without accompaniment for both the presentation of the melody and the child's response. The sample was evenly distributed among the three forms.

The accuracy with which children responded to a short melodic fragment was not influenced by either a harmonic treatment of the melodic fragment or by the harmonic treatment of the response. However, children did have significantly higher mean scores for accuracy when the presentation of the melodic fragment and the response was supported by the primary chord treatment. The sustained single chord was more helpful to children's singing than the multi-chord progression but not as helpful as the primary chords. There was not a significant

difference between the three harmonic treatments when the accompaniment was applied only to the presentation of the melodic fragment.

Petzold was interested in the effect of different types of harmonic accompaniment on student's ability to sing melodic fragments accurately. The present study is concerned with only one type of harmonic accompaniment and the effect it has on children's ability to sing entire songs accurately and to improvise within the context of major tonality. From the results of Petzold's study, it seems reasonable to suggest that an uncomplicated harmonic accompaniment is easier for children to comprehend. However, is the accompaniment using primary chords simple enough? Would Petzold have had the same results using a root melody accompaniment instead of a sustained single chord? The sustained single chord gives little information about the harmonic context of a melodic fragment or song. A root melody accompaniment is simple in terms of the number of sounds presented at one time, yet it provides a great deal of information about the tonality of the song.

The purpose of Azzara's study (1992) was to enhance the music achievement of elementary instrumental music students through a researcherdesigned improvisation curriculum. The specific problems of his investigation were to examine (1) the effect of improvisation on music achievement and (2) the effect of levels of aptitude on music achievement. Although Azzara's study does not focus specifically on harmony, the harmonic nature of the treatment is relevant to the present study.

Fifth-grade wind and percussion music students from two schools served as subjects. Students in both schools had completed one year of instrumental music instruction using Jump Right In: The Instrumental Series (Grunow & Gordon, 1989). Azzara administered *Music Aptitude Profile* (Gordon, 1965) to students in the treatment and control groups prior to treatment. The experimental treatment involved the use of an improvisation curriculum designed for the study. Students were randomly assigned to the experimental treatment by homogeneous instrument classes (three to six students per group). The treatment period lasted 27 school calendar weeks. The treatment group (1) audiated and improvised tonic and dominant function patterns in major tonality using neutral and solfege syllables, (2) sang all tonic and dominant chord members through a progression in major tonality, using neutral and solfege syllables, (3) improvised through a tonic/dominant chord progression in major tonality while other students sang the chord tones, (4) while others sang the tonic/dominant chord progression in major tonality, individual students sang the chord roots using neutral and solfege syllables (5) improvised duple meter patterns, using neutral and rhythm syllables, (6) combined tonal and rhythm improvisation, and (7) improvised to the chord progressions of various songs. The control group did not receive improvisation instruction.

At the end of the treatment, all students performed three criterion etudes written by Azzara to measure their music achievement. The first etude was student-prepared, the second etude was prepared with the help of the teacher, and the third etude was sight-read. Four independent judges rated the etude

performances using researcher-designed five-point continuous tonal and rhythm rating scales, and a researcher-designed five-point additive expression rating scale.

Significant differences existed between students who received instruction that involved the use of the improvisation curriculum and those who did not. The treatment group received higher ratings on the three criterion etudes than students in the control group. As expected, significant differences were also found between aptitude levels. The group of students who were classified as having high music aptitude demonstrated higher achievement. "With improvisation skill, students can express their musical thoughts spontaneously. This expression is possible when students comprehend the tonal and rhythm patterns and can combine and sequence them in a syntactical manner, they internalize a sense of tonality and meter. This kind of understanding engenders an understanding of harmonic progression. Harmonic progression is defined in a linear sense by (1) where the harmony changes (tonality) and (2) when the harmony changes (meter)" (p. 69).

The students in Azzara's study had many opportunities to familiarize themselves with harmonic progressions. They heard bass lines, sang bass lines, part-sang the chords of harmonic progressions, and improvised melodies to the bass lines of a variety of songs in major tonality. The children in the present study will hear a variety of bass lines to rote songs and improvise tonic, dominant, and subdominant functions in both major and harmonic minor tonalities. The students in Azzara's study were much older and probably had the

readiness to sing bass lines and part-sing chords. These were not developmentally appropriate tasks for the children in the present study and, therefore, were not included. The control group in Azzara's study did not have improvisation instruction. The present study will include improvisation for the treatment as well as the control group. This may provide information about whether hearing bass lines helps children develop a sense of "where" and "when" harmony changes.

In order to examine the effects of melodic and harmonic contexts on the singing and aural discrimination abilities of children, Stauffer (1986) asked children to echo melodic patterns within the context of different melodic and harmonic accompaniments. Children in first through third grade (N=310) served as subjects. The children received twelve weeks of instruction, which included melodic echo training tapes that incorporated various accompaniment contexts. The four accompaniments were: (1) no context, (2) melodic context, (3) harmonic context, (4) melodic and harmonic contexts. Intact classes within each grade were randomly assigned to one of the four treatment groups.

Three data collection instruments were used as pretest-posttest measures: *Primary Measures of Music Audiation* (PMMA), Melodic Echo Test (MET), and Test of Singing Ability (TSA). *The Wide Range Achievement Test – Revised* (WRAT-R) was used as a pretest. It is an academic achievement test to study the development of reading, spelling, and arithmetic. Stauffer used this test to examine differences between the two schools and to determine if a relationship existed between reading achievement and musical skills. The How I

Feel About Music survey, Froseth's revised attitude and interest survey, was used to collect additional data about the student's musical background and preference for musical activities.

Only the results that directly relate to this study will be reported. No significant differences were found between PMMA posttest mean scores for the four main treatment groups. However, gains for the *Tonal* subtest of PMMA were significant for all children regardless of treatment group. Significant differences were identified in both *Tonal* pretest and posttest PMMA scores when children were grouped by grade level, with consecutive grades scoring higher. In addition, first- and second-grade children showed greater improvement than third-grade children. "It appears that improvement in aural discrimination skills may have been more rapid for younger subjects" (pp. 129-130).

The MET contains twenty melodic patterns that students listen to and then echo through singing. Interjudge reliabilities for both the pretest and posttest were .92. No significant differences were found for MET between the four treatment groups. Children's ability to imitate melodic patterns was not affected by the type of harmonic treatment they received. However, their ability to accurately imitate these patterns did significantly increase, regardless of treatment. An interaction effect of melody, harmony, and grade was found. Further analysis revealed that an interaction between melody and harmony was evident for third-grade subjects only. In the first and second grades, children in the Melody treatment groups scored higher on MET than children in the No Melody group. This indicates that the harmonic treatment may have been more

effective for children in the third grade than for children in the first and second grades. "These results may confirm research, which indicates that harmonic discrimination, develops at approximately age eight, or third grade" (p. 212). "Some effect may be attributed to the interaction of melody and harmony for third grade students, but it appears that the no harmony treatment may be more beneficial for first-grade and second-grade subjects" (pp. 161-162).

The TSA measures children's ability to accurately sing five rote songs. The children's performance of each song is rated using a five-point continuous rating scale. The interjudge reliability for TSA was .82 for the pretest and .87 for the posttest. Children in each grade improved in their ability to sing rote songs. The mean TSA scores were not significantly different among the four treatment groups after instruction. However, the posttest mean score for each group was significantly higher, regardless of treatment.

In conclusion, Stauffer (1986) suggests that (1) aural discrimination of tonal patterns, vocal imitation of melodic patterns, and ability to sing rote songs are strongly related, (2) aural discrimination and singing skills improve with training regardless of musical context, (3) harmonic context used in music training tasks may be more beneficial to older children than younger children, and (4) musical skills are affected by maturation, with more rapid growth occurring in earlier grades.

The treatment in Stauffer's (1986) study differs from the present study in that Stauffer used melodic echo training tapes to incorporate the various accompaniments into instruction. The instructional procedures for the present

study will not include training tapes. The melodic accompaniments will be provided through live performance on a variety of instruments, including the voice. In addition, the treatment period for the present study will be twice as long – 24 weeks instead of 12. The effects of a year of instruction are more likely to hold up over time (Taggart, 1997) than the effects of a 12-week instructional period (Flohr, 1981). The biggest difference between the two studies is the type of harmonic accompaniment used during the treatment period. Stauffer (1986) used no harmonic accompaniment, melodic accompaniment, harmonic accompaniment, and melodic and harmonic accompaniment. It may be possible that a simple harmonic accompaniment may increase children's vocal accuracy, whereas more complex harmonic accompaniments may not. Therefore, the present study will use a root melody accompaniment in place of chordal harmony. No studies to date have examined the effect of a root melody accompaniment on children's vocal achievement.

Hale (1977) investigated the effect of piano accompaniment on children's singing development. She specifically examined if kindergarten children's (N = 247) singing should be accompanied on the piano (sometimes autoharp) using (1) only harmonic accompaniment or (2) a three step sequence, beginning with melodic reinforcement (melody played in octaves), followed by melodic reinforcement and harmonic accompaniment together, and then finally harmonic accompaniment alone.

The children were randomly assigned to one of the two groups on an individual basis and not on the basis of membership in a particular class. The

treatment occurred throughout an entire school year. During a five-day period, two criterion songs, one in major tonality and one in minor tonality, were taught to the children. The harmonic accompaniments were used during instruction. At the end of the treatment period, children were asked to sing two criterion songs without accompaniment. Both criterion songs were in duple meter in order to control for the effect of meter on the children's song performance. Children sang the two criterion songs again a week after the original performance to establish test/retest reliabilities of the ratings.

Two independent judges using a five-point continuous performance rating scale rated the children's singing. When combining the ratings of the children's first and second week song performances, the interjudge reliability was .71 for the major tonality song and .71 for the minor tonality song. An interjudge reliability (r = .83) for the composite score (major and minor combined) was also reported. The judges' combined ratings of children's performance had reliabilities of .76 for the major song, .77 for the minor song, and .92 for the major and minor composite score.

Children who received song instruction with melodic and harmonic accompaniment scored significantly higher on the criterion measure for both the major and minor song than did children who received song instruction with harmonic accompaniment alone. As a result, Hale suggests, "piano accompaniment retards the development of students' singing ability" (p. 40).

There are several similarities between Hale's study (1977) and the present study. First, the children were asked to sing two criterion songs, one in major

tonality and one in minor tonality. Both studies used criterion songs in duple meter to control for the effect of meter on the children's song performance.

The Hale study differs from the present study on several accounts. The children in Hale's study were randomly assigned to one of the two groups, whereas the present study used intact classes of children. Hale used only children in kindergarten, while the present study incorporated children in kindergarten and first grade. The present study used a variety of instruments when performing root melody accompaniments to control for the effect of instrument type. Hale used plano and autoharp only. Another difference between the two studies is that Hale used type of accompaniment (harmonic or melodic/harmonic) as an independent variable, whereas the present study used root melody accompaniment. Hale found that children who received song instruction with melodic and harmonic accompaniment scored significantly higher those children who received song instruction with harmonic accompaniment only. It may be possible that children in the melodic and harmonic accompaniment group were merely imitating the melody as it was played. This may explain the difference in song performance scores between the two groups. Therefore, the present study used a root melody accompaniment instead of melodic accompaniment in order to control for imitation.

Summary

There is inconclusive evidence regarding the effects of harmonic accompaniment on children's singing. Some studies found that harmonic

accompaniment had no effect on children's singing accuracy (Atterbury & Petzold, 1966; Stauffer, 1986). Other studies found that harmonic accompaniment had a significant effect on children's singing accuracy (Hale, 1977; Kimble, 1984; Sterling, 1985). In addition, no harmonic accompaniment (English, 1985) or simple harmonic accompaniment (Kimble, 1984; Petzold, 1966; Sterling, 1985) appears to be more beneficial than complex harmonic accompaniments. Azzara (1992) found that students who learned to improvise by hearing and singing bass lines and chords within the context of harmonic progressions achieved at higher levels than students who did not have such instruction.

Considering the studies reviewed in this section, the importance of the present study becomes apparent. Research comparing the effects of simple harmonic accompaniment with a cappella singing is in order (Goetze, Cooper, & Brown, 1990). Perhaps simpler is better. It is possible that even primary triads are too much for young children to attend to. It is conceivable that root melodies provide the most appropriate level of harmonic context for children who are developing audiation skills. Therefore, the harmonic accompaniment used in the present study will be the root melody or melodic line created by the fundamental pitch of the harmonic functions found in the songs. Furthermore, in light of the scarce number of studies involving the effects of harmonic accompaniment on young children's vocal achievement and improvisation, this study is an important step in the continuum of research that seeks to define factors that are beneficial to children's developing musicianship.

Chapter Summary

The research reviewed in this chapter focuses on four major areas: (1) the effect of instruction on developmental tonal aptitude; (2) the instructional factors that affect children's vocal accuracy; (3) the effect of instruction on improvisation; and, (4) the effect of harmonic accompaniment and instruction on children's vocal accuracy. Studies that are closely related to the aforementioned sections were presented to provide the research base and the motivating force behind the present study.

The researchers presented in this chapter concluded the following: (1) developmental tonal aptitude may increase as a result of instruction; (2) children's singing accuracy may improve as a result of instruction; (3) children's instrumental improvisations can reflect a sense of tonality given instruction; and (4) vocal instruction that includes harmonic accompaniment may or may not improve children's singing accuracy.

The studies in this chapter regarding the effect of instruction on developmental tonal aptitude either compared the effects of different approaches in vocal music instruction or compared the effects of instruction versus no music instruction. The present study compares two different kinds of instruction – instruction with and without harmonic accompaniment and its effect on developmental tonal aptitude. All researchers discussed in this chapter used *Primary Measures of Music Audiation* to measure children's developmental music aptitude. This study differs in that *Intermediate Measures of Music*

Audiation serves as a pretest and posttest measure, because *Primary Measures* of *Music Audiation* was too easy for the children who participated in this study.

Most of the studies that focused on the effect of instruction on children's tonal achievement had limited instructional time. The treatment periods ranged from four hours to several weeks to a few months. The treatment period for the present study spans more than seven months and includes more frequent sessions. Rutkowski (1996) states that research with young children involving short treatment periods may result in premature conclusions. Additionally, in many of the other studies, researchers entered into classrooms for the purpose of conducting research and were not familiar with the children prior to the study. This study varies from the others in that the researcher has taught music to all of the children for two years prior to the study.

The studies on the effect of instruction on improvisation focused on either a specific methodology (Dalcroze) or on instrumental improvisations. Only one of the studies presented in this chapter sought to examine children's vocal improvisations. It is one thing to improvise using an instrument and quite another to improvise vocally, which requires one to rely solely on audiation skills to accomplish an improvisational task. When children improvise vocally, one has a window into the level at which they have internalized a music vocabulary. Therefore, unlike most studies involving young children and improvisation, the present study incorporates vocal improvisation as a measure of children's tonal achievement.
The studies on the effect of harmonic accompaniment on tonal achievement focused on either accompaniment versus no accompaniment or on the difference between various harmonic contexts. The present research relates most closely to the harmonic/no harmonic accompaniment studies. The piano served as the source of harmonic accompaniment for the studies discussed in this chapter. The present study uses a variety of instruments, including piano and voice. Furthermore, it appears that a simple harmonic accompaniment may increase children's vocal accuracy, whereas more complex harmonic accompaniments may not. With this in mind, the present study uses a root melody accompaniment in place of chordal harmony. No studies to date have examined the effect of a root melody accompaniment on children's tonal achievement.

The present study seeks to fill some of the gaps in the studies presented above by investigating the effect of (1) song instruction including root melody accompaniment on developmental tonal aptitude, (2) song instruction including root melody accompaniment on tonal achievement, and (3) song instruction including root melody accompaniment on tonal improvisations. No other study to date has examined the effect of harmonic accompaniment on improvisations. It is the intent of this researcher to gain insight into the issues presented above and to provide an impetus for further research.

CHAPTER THREE

DESIGN AND ANALYSIS

<u>Sample</u>

Sixty-eight kindergarten students and 68 first grade students (N=136) participated in the study. The children in this study were from four intact kindergarten classes (17 students per class) and four intact first grade classes (17 students per class). All of the students attended a private independent school in Bloomfield Hills, Michigan. The children in the school ranged from age three through the fifth grade and came from a primarily white, upper-class background.

Children at the school maintained a six-day cycle. This meant that teachers and children followed a schedule that was based on A through F Days instead of the typical Monday through Friday schedule. For example, the first Monday of the school year followed an "A Day Schedule," Tuesday followed a "B Day Schedule," Wednesday followed a "C Day Schedule," Thursday followed a "D Day Schedule," and Friday followed an "E Day Schedule." The schedule for the second Monday of the school year followed the "F Day Schedule," followed by the "A Day Schedule" on Tuesday, the "B Day Schedule" on Wednesday, the "C Day Schedule" on Thursday, and the "D Day Schedule" on Friday. The sixday cycle continued in this manner for the remainder of the school year. The sixday cycle was put into place at the school in order to create a sense of balance

within the school day. As a result of the schedule, children spent more time with their homeroom teachers, had fewer interruptions in their day, and were able to experience many special class offerings (music, drama, dance, art, physical education, Spanish).

Children in kindergarten received 30 minutes of formal music instruction twice per cycle. The children in first grade received 40 minutes of formal music instruction three times per cycle. This schedule continued for the duration of the study.

The music curriculum that was typically used for all of the children in kindergarten and two of the first grade classes was based on Music Learning Theory (Bolton et. al., 2001; Gordon, 1997; Taggart et. al., 2000), which is a theory of how children learn music. Instruction that is based on Music Learning Theory includes two parts: learning sequence activities and classroom activities. Learning sequence activities, or pattern instruction, are research-based (Gordon, 1974, 1976) and sequentially introduce new skills, such as tonal and rhythm solfege, identification of tonalities and meters, identification of pattern functions (i.e., tonic, dominant, macrobeat/microbeat, division/elongation), and improvisation. Classroom activities include active music making through singing, chanting, movement, and playing instruments. Children also apply to listening what they have learned while making music. Classroom activities and learning sequence activities are taught together and coordinated with one another in order that children understand and comprehend the music they hear and perform. The researcher taught these classes. Two other music specialists taught the

remaining two first-grade classes that were used in this study. The approach to music instruction that was most familiar to one first-grade music teacher was based primarily on Orff's philosophy. The underlying belief of Orff-Schulwerk is that music is elemental, and instruction should be based on what children do naturally. In general, learning is an integration of music, speech, movement, drama, and performance experiences with Orff instruments. The approach to music instruction that was most familiar to the other music teacher was that of the Kodaly philosophy. This philosophy has grounding in folk song literature and emphasizes music literacy – solfege, music reading through Curwen-Kodaly hand signs, and writing.

<u>Design</u>

The design of this study was treatment by levels. The treatment was instruction including songs with no root melody accompaniment or song instruction including root melody accompaniment. The level was grade in school (kindergarten or first).

Procedures

After the researcher's guidance committee accepted the proposal, a copy of the proposal was submitted to the University Committee on Research Involving Human Subjects (UCRIHS). After permission for conducting the research was granted by UCRIHS (see Appendix A), the researcher submitted a copy of the proposal to the school administrators, received permission for

conducting research, and distributed information about the research study to kindergarten and first-grade parents (see Appendix B). A parental consent form (see Appendix C) accompanied the letter. Participation in the study was entirely voluntary, and a child could withdraw from the study or refuse to respond at any time without penalty. The researcher ensured confidentiality of all student responses. All of the consent forms were returned, and therefore all of the children participated in the study.

This study involved a treatment group consisting of two randomly selected kindergarten classes, one randomly selected first-grade class taught by the researcher, and one of the two first-grade classes taught by one of the other two teachers.

The researcher provided instruction to two kindergarten control groups, two kindergarten treatment groups, one first-grade control group, and one firstgrade treatment group. Another teacher provided instruction to one first-grade control group and a different teacher instructed one first-grade treatment group (Table 1).

Table 1

Teacher Assignments

	Experimental Experimental		Control	Control
SK	Researcher	Researcher	Researcher	Researcher
1	Researcher	Teacher 1	Researcher	Teacher 2

For the treatment group, a root melody accompanied eighty percent of the rote songs used in each instructional period. Other than the use of root melodies for the treatment group, all children received the same instructional content. The music instruction provided by all three music teachers included Learning Sequence Activities (Gordon, 1992a, 1992b, 1992c), acculturation and performance of rote songs and chants in an array of tonalities and meters, vocally produced rhythm and tonal creativity/improvisation, expressive movement activities, beat coordination activities, play parties, and instrumental performance experiences using simple unpitched percussion. Song repertoire (see Appendix D) and all lesson plans (see Appendix E & F) were developed by the researcher and were adhered to by all teachers involved in this study. A 50-minute planning meeting occurred on every C Day throughout the treatment period to insure that instruction between the three music teachers was as similar as possible.

One factor that may affect the vocal accuracy of children is the model that children hear. Studies suggest that the female voice and pitches that are within the vocal register of the child's own voice are the best models for supporting accurate singing (Brown, 1988; Clegg, 1966; Froehlich, 1977; Green, 1987 & 1990; Hermanson, 1972; Kramer, 1986; Moore, 1991; Petzold, 1966; Sims, Moore, & Kuhn, 1982; Small & McCachern, 1983; Smith, 1963; Yarbrough, 1991, 1992). Because it is impossible for one teacher to sing both the song and root melody at the same time, other options needed consideration. In order to control for the effect of a tonal model, the simultaneous performance of the song and the root melody was presented using a variety of performance mediums: bass metalophone and xylophone bars; alto metalophone and xylophone bars; voice recordings; live vocal performance; piano. In addition, when it was developmentally appropriate, children in first grade also heard and then sang the root melody without the song and then with the song within the context of group and individual singing. Because it is not developmentally appropriate, the children in kindergarten were not asked to perform the root melody in this way. Part-singing is a difficult task for children this young (Hufstader, 1977; Zimmerman, 1971).

The Intermediate Measures of Music Audiation was administered during the week of September 11, 2001 and then again during the first week in April 2002. Both the *Tonal* and *Rhythm* subtests were administered so that the necessary information about individual's strengths and weaknesses was

available for instructional purposes. However, only the *Tonal* subtest was used in the analysis as a dependent variable.

Post-instructional performance testing occurred beginning the second week of April 2002. Individual children were taken out of their regular class and led into the music room. This room served as the music room for all but two of the first-grade classes. These children were familiar with the room, because it was where they had received music instruction for the last three years. In addition, the researcher did not pose a threat to the children, because they were all familiar with her as their past or current music teacher. After children gave verbal assent (see Appendix G), they individually performed two rote songs without text, one in major tonality/duple meter and one in minor tonality/duple meter, and improvised an ending to a major tonality/duple meter song without text (see Appendix H). All singing was performed without root melody accompaniment.

Two criterion songs, one in major tonality and one in minor tonality, were taught to all children four weeks prior to the end of the treatment period (see Appendix I). The songs were composed by the researcher to insure that the song content accurately reflected the criteria found in the rating scale. Both criterion songs were in duple meter in order to control for the effect of meter on song performance. In addition, both songs had an equal number of phrases. Levinowitz, Barnes, Guerrini, Clement, D'April, & Morey (1998) found that the reliabilities for their major criterion song were slightly higher than for their minor criterion song. They suggest that this occurred because the minor criterion song

contained more phrases than the major criterion song, so children's audiation skills were challenged. The longer song may have left the children with more of a chance for inconsistency with their singing performance. The researchers suggest that more research is needed before conclusions can be made regarding children's performances of major versus minor songs. Finally, in light of the research suggesting that children may sing with greater accuracy when songs do not include text (Richner, 1976; Levinowitz, 1989), the criterions songs used in this study were sung without text.

Solo singing was a common practice during regular music instruction, so singing for the researcher did not seem out of the ordinary. All of these performances were recorded using an Olympus Voice and Music DM-1 Digital Voice Recorder so that they could be rated at a later time. Prior to recording, the children heard the tonic and dominant pitch of the song they were about to sing performed on a resonator bell. Then the researcher sang the appropriate preparatory sequence (see Appendix J) before the children sang the criterion song. For example, if a child was to sing a song in major tonality and the keyality of D, he or she heard the d¹ and a¹ resonator bells. Next, the researcher turned on the digital voice recorder and sang the appropriate major preparatory sequence using a neutral syllable and gestured for the child to begin singing. The digital voice recordings were stored on a computer in one of three files (major, minor, improvisations). The recordings in each of the three files were randomly rearranged by "dragging" a child's recording into a different position and "dropping" it into place. In so doing, not only was the presentation order

different from the original, it was also different for each of the three files. The rearranged files were then copied onto Maxell CD-R compact discs.

To control for the effect of presentation order, some of the children improvised first, followed by the singing of the rote songs. Some children sang the rote songs first, followed by the improvisation. Other children sang one rote song, followed by the improvisation, and then another rote song. Furthermore, the presentation order of the rote songs alternated between the two tonalities. The digital voice recordings were divided so that there was one digital voice file containing the major tonality rote song performances, a separate file containing the minor tonality rote song performances, and a third set of files containing the children's improvisations. For each of the three separate digital voice files, the treatment and control groups were intermingled and the presentation order was rearranged for each file in order to eliminate as much bias as possible. Compact disc recordings were produced from each of the three digital voice files.

Three independent judges reviewed the compact disc recordings and rated the children's song performances using the Tonal Rating Scale and the children's improvisations using the Improvisation Rating Scale. The judges received training in the use of the two criterion measures beforehand. To increase judge objectivity in the rating of the student's performances, the judges had no knowledge of the background and specific ages of the students. Each judge received three compact discs, one containing the major rote song performances, one containing the minor rote song performances, and another containing the improvisation performances.

Research Instruments

Three criterion measures were used for this study. The *Tonal* subtest of *Intermediate Measures of Music Audiation* (IMMA) (Gordon, 1982) served as a pretest and posttest measure of the developmental tonal aptitude of all students participating in this study.

The *Primary Measures of Music Audiation* (Gordon, 1979) is typically given to kindergarten and first-grade students. However, after several years of administering PMMA to students at this particular school, the researcher found that the majority of scores fall in the 90th to 99th percentile range. Therefore, she elected to use IMMA instead. IMMA is designed for those students who score exceptionally high on PMMA (Gordon, 1986).

The *Tonal* subtest of *Intermediate Measures of Music Audiation* (IMMA) consists of 40 pairs of tonal patterns each containing three pitches. The patterns are performed with a consistent tempo and without rhythm. All patterns are in the keyality of C and in major or harmonic minor tonalities.

The students are asked to listen to the test recording and then decide if each of the paired patterns (or songs as they are called in the test) are the same or different. The paired patterns are identified on the recording by the name of an object – "pencil" or "book," for example. Next the students hear the word "first," followed by the first pattern of the pair and then the word "second," followed by the second pattern of the pair. The object name given to the paired patterns corresponds to a picture above a set of boxes on the test answer sheet (see Appendix K). The top box of the set has two faces that look the same (two

smiling faces), and the bottom box has two faces that look different (one smiling face and one frowning face). The students mark the answer sheet by drawing a circle around the box on top with the two faces that look the same if they think that the two parts of the song sounded the same. If the students think the two parts of the song were different, they are to draw a circle around the bottom box with the two faces that are different.

A second measure was used to rate the children's performance of two criterion songs. The Tonal Rating Scale (see Appendix L) was developed based on Levinowitz's (1987) Tonal Rating Scale. Levinowitz's scale is a five-point continuous rating scale used to assess children's singing achievement. The scale consists of two dimensions – tonal and rhythm. When used by Levinowitz, the interjudge reliabilities for ratings of kindergarten children's major and minor songs combined was .89. Interjudge reliabilities for first grade children (r = .94) were slightly higher. The Tonal Rating Scale used for this study is similar to the Levinowitz scale in that it is a five-point continuous rating scale with two dimensions. The tonal dimensions of the two scales have similar criteria. The difference lies in the second dimension. Because rhythm was not a concern of this study, the second dimension focused on the children's ability to remain in a given keyality.

A third measure was used to rate the children's tonal improvisations. The Improvisation Rating Scale (see Appendix M) was developed by the researcher and used to measure the tonal strength of the children's improvisations.

Data Analysis

Means and standard deviations were computed for pretest and posttest IMMA *Tonal* subtest scores and for scores on the Tonal Achievement Rating Scale and the Improvisation Rating Scale. Means and standard deviations were computed for each treatment, each level, and for the separate age levels within the treatment and control groups. In addition, split-halves reliabilities corrected for length with the Spearman-Brown Prophecy formula were calculated for IMMA *Tonal* subtest scores of the pretest and posttest administration. The interjudge reliabilities of the Tonal Achievement and Improvisation Rating Scales were calculated as well.

In order to establish whether there were preexisting differences between mean scores split by grade on IMMA *Tonal* subtest, an unpaired *t* test was conducted. To determine the affect of root melody accompaniment on the developmental tonal aptitude of kindergarten and first-grade children, a two-way analysis of variance (treatment x grade level) was conducted to determine whether any significant differences exist between the two treatment groups or levels. If significant differences occurred favoring the use of a harmonic context when teaching songs, findings would add to the body of research that instruction influences children's developmental tonal aptitude. There may be greater gains in aptitude when root melody accompaniment is used with song instruction. If no significance is found, several speculations would be made on the possibility of song instruction including both songs with and without root melody

accompaniment. It may be possible that aptitude is unaffected by the simultaneous presentation of melody and harmony.

To determine the affect of root melody accompaniment on the vocal achievement of kindergarten and first-grade children, a two-way analysis of variance (treatment x grade level) was conducted to determine whether any significant differences exist between the two treatment groups or levels. If significant differences occurred favoring the use of a harmonic context when teaching songs, findings would add to the body of research that children sing more accurately when root melody accompaniment is used during instruction. If no significance is found, several speculations would be made on the possibility of song instruction including both songs with and without root melody accompaniment. It may be possible that children cannot focus on more than one thing at a time, and the simultaneous presentation of melody and harmony is more information than young children can digest at one time.

To determine the affect of root melody accompaniment on the vocal improvisation of kindergarten and first-grade children, a two-way analysis of variance (treatment x grade level) was conducted to determine whether any significant differences exist between the two treatment groups or levels. If significant differences occurred favoring the use of a harmonic context when teaching songs, findings would add new information to the research literature suggesting that children's vocal improvisations are more cohesive when root melody accompaniment is used during instruction. That is, children's improvisations convey a greater sense of being constructed around a key center

and a more refined sense of finality or conclusion. If no significance is found, several speculations would be made on the possibility of song instruction including both songs with and without harmonic accompaniment. Alpha was set at .05 level for all analyses.

CHAPTER FOUR

RESULTS AND INTERPRETATIONS

Reliabilities of Pre-Instruction and Post-Instruction *Tonal* subtest of Intermediate Measures of Music Audiation

Split-half reliabilities were computed for the present study using the preinstruction and post-instruction administration of the *Tonal* subtest of IMMA for the kindergarten and first grade children. The split-halves reliability coefficients for the pretest and posttest of IMMA for first-grade in the present study were comparable to the ones reported in the IMMA Manual (Gordon, 1986). The splithalves reliability coefficient reported in the IMMA Manual for first-grade students for the *Tonal* subtest is .76. The split halves reliabilities, corrected using Spearman Brown Prophecy, for the pre-instruction administration were .76 for children in kindergarten and .83 for children in the first grade. The split halves reliabilities, corrected using Spearman Brown Prophecy, for the post-instruction administration were .83 for children in kindergarten and .66 for children in the first grade.

Reliabilities of Tonal Achievement Rating Scale

At the conclusion of the 25-week instructional period, three independent judges rated the students' performances of the two criterion songs (see Tables 2

and 3). The interjudge reliabilities were as follows: Tonality Dimension for the major criterion song ranged from r = .76 to .84; Tonality Dimension for the minor criterion song ranged from r = .77 to r = .79; Keyality Dimension for the major criterion song ranged from r = .69 to r = .79; Keyality Dimension for the minor criterion song ranged from r = .69 to r = .80; major tonality composite reliabilities ranged from r = .83 to r = .83 to r = .87; minor tonality composite reliabilities ranged from r = .83 to r = .89, and; composite tonal achievement reliabilities ranged from r = .88 to r = .93. The reliability coefficients ranged from moderate to high, and the ratings appear to be reliable.

Table 2

Interjudge Reliabilities for Rating Scales

Major – Tonality Dimension						
	Judge 1	Judge 2	Judge 3			
Judge 1	1.00	.77	.76			
Judge 2	.77	1.00	.84			
<u> Minor – Tonality Dir</u>	nension					
Judge 1	1.00	.79	.78			
Judge 2	.79	1.00	.77			
<u> Major – Keyality Dir</u>	nension					
Judge 1	1.00	.79	.73			
Judge 2	.79	1.00	.69			
<u> Minor – Keyality Dir</u>	nension					
Judge 1	1.00	.70	.80			
Judge 2	.70	1.00	.66			
<u> Major – Composite</u>	Score					
Judge 1	1.00	.87	.85			
Judge 2	.87	1.00	.83			
<u> Minor – Composite</u>	Score					
Judge 1	1.00	.85	.89			
Judge 2	.85	1.00	.83			

Table 3

Interjudge Reliabilities for Composite Tonal Achievement Score

	Judge 1	Judge 2	Judge 3
Judge 1	1.00	.91	.93
Judge 2	.91	1.00	.88

Reliabilities of the Improvisation Rating Scale

At the conclusion of the 25-week instructional period, three independent judges rated the students' improvisations (see Table 4). The interjudge reliability ranged from .74 to .80 for the improvisation rating scale.

Table 4

Interjudge Reliabilities for the Improvisation Rating Scale

	Judge 1	Judge 2	Judge 3	-
Judge 1	1.00	.74	.76	
Judge 2	.74	1.00	.80	

<u>The Effect of Root Melody Accompaniment to Songs on the Developmental</u> <u>Tonal Aptitude of Children in Kindergarten and First Grade</u>

Unpaired t Test of IMMA Pre-Instruction Tonal Scores

In order to establish whether there were preexisting differences between mean scores split by grade on IMMA *Tonal* subtest, means and standard deviations were calculated (see Table 5) as well as an unpaired *t* test (alpha of .05). There was no significant difference between the experimental and control groups with grade levels combined, between the experimental and control groups for children in kindergarten, or between the experimental and control groups for children in first grade (see Table 6).

Table 5

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<u>Groupings of Pre-Instruction Tonal Scores Between Treatment Groups and Split</u> by Grade

	N	М	SD
Experimental: Total	68	30.71	4.66
Control: Total	68	30.40	4.44
Experimental: SK	34	29.65	4.77
Control: SK	34	28.38	4.24
Experimental: 1st	34	31.77	4.36
Control: 1st	34	32.41	3.69

Table 6

Unpaired t Test of Pre-Instruction Tonal Scores Between Treatment Groups and Split by Grade

	MD	df	t	p
Experimental, Control: Total	31	134	40	.69
Experimental, Control: SK	-1.65	66	-1.16	.25
Experimental, Control: 1st	65	66	66	.51

p > .05

Means and Standard Deviations of *Tonal* subtest of IMMA Post-Instruction Scores

Means and standard deviations for the post-instruction scores of the *Tonal* subtest of IMMA are presented in Table 7. The experimental group with grade levels combined received slightly higher tonal aptitude scores than the control group with grade levels combined. The scores of the kindergarten experimental group were slightly higher than those of the kindergarten control group on the post-instruction administration of IMMA. The scores of the first-grade experimental group and the first-grade control group were similar.

The standard deviation for the experimental group with grade levels combined was similar to that of the control group with grade levels combined, indicating similar variability of scores between the two groups. The standard deviation for the kindergarten experimental group was comparable to that of the

kindergarten control group, indicating similar variability of scores between the two groups. The standard deviation for the first-grade experimental group was comparable to that of the first-grade control group, indicating similar variability of scores between the two groups.

Table 7

	<u>N</u>	М	SD
Experimental Total	68	33.66	3.85
Control Total	68	32.77	3.79
SK, Experimental	34	33.06	4.40
SK, Control	34	31.44	4.12
1st, Experimental	34	34.27	3.16
1st, Control	34	34.09	2.93

Means Table of Post-Instruction Developmental Tonal Aptitude Scores

ANOVA of Post-Instruction IMMA Tonal Scores

In order to determine whether the use of a root melody accompaniment with song instruction has an effect on developmental tonal aptitude, a two-way analysis of variance (treatment x grade level) was conducted ($p \le .05$). Results (see Table 8) indicated no significant interactions or differences as a result of treatment. However, there was a significant difference between levels. As would be expected, children in the first grade had significantly higher tonal aptitude scores than children in kindergarten.

Table 8

	df	SS	MS	F	Q
Grade	1	126.18	126.18	9.20	.00*
Treatment	1	27.36	27.36	1.99	.16
Treatment x Grade	1	17.65	17.65	1.29	.26
Residual	132	1809.62	13.71		
+					<u> </u>

ANOVA Table of Posttest Developmental Tonal Aptitude Scores

**p* < .05

Interpretation of IMMA Tonal Aptitude Scores

In this study treatment had no effect on the developmental tonal aptitudes of young children. However, children in first grade did better than children in kindergarten. Children's developmental aptitude scores increase as a result of age, regardless of treatment.

An explanation for the lack of differences due to treatment may be that the *Tonal* subtest of IMMA was too easy for the children in this study. The postinstruction tonal aptitude mean scores are well above the mean reported in the test manual (Gordon, 1986). Gordon reports a mean of 31.1 for children in first grade. The aptitude mean scores of the children in this study ranged from 31.44 (kindergarten control group) to 34.27 (first-grade experimental group). This may have resulted in the lower split-halves reliability (.66) of the post-instruction administration for children in first grade. When too many children receive relatively the same score, reliability decreases. It was apparent going into this study that IMMA might not be ideal for this particular group of children. However, because no more difficult and age-appropriate developmental aptitude test exists, there was no other choice.

Another possibility is that children in this study received two years of informal music guidance prior to formal music instruction. The environment has an affect on children's aptitude until about age nine (Gordon, 1980b, 1989, 1997c, 1998a, 1999; Taggart, 1997). The high aptitude levels found in this study may be, in part, the result of the rich and varied listening vocabulary children gained as a result of this informal guidance. Another aspect of informal guidance and formal music instruction that may have supported the developmental tonal aptitude of the children in the present study is individualized instruction. Knowing the tonal strengths and weakness of individual children, and individualizing instruction to meet these needs, helps children to realize their music potential. Because these children's aptitudes were so high to begin with, it is possible that there was not sufficient room for growth as a result of treatment.

Parental involvement in music is extremely high at this particular school. Gordon (1976) investigated the relationship of environmental factors to both music aptitude and achievement test scores. He found that that several factors (e.g., "siblings sing or play" and "a piano at home") had great influence on a child's achievement. Many parents report that they sing and play music for their

children on a regular basis. Several of the parents are professional musicians in major orchestras, and a few are well-known composers. In addition, the importance of the arts is recognized in the school's mission statement. Furthermore, the majority of students who attend this school come from an upper-middle or high socio-economic class. Participation in music activities is encouraged and supported through the home and school environment, and, thus, music plays a major role in the life of children at this school. This is not the case for most schools across the country.

It is possible that 25 weeks of song instruction using root melody accompaniment was not enough to affect children's developmental tonal aptitude. Although the differences between the combined experimental group and combined control group were not significant, the mean scores tended to be higher for the combined experimental group. Furthermore, the kindergarten experimental group tended to receive higher mean scores than the kindergarten control group. The same trend also occurred between the first-grade experimental group and the first-grade control group. A longer treatment period may have yielded different results.

In the analysis of the pre-instruction and post-instruction IMMA tonal aptitude scores by age-level, it was found that children in kindergarten scored significantly lower than the children in first grade. Because older children score better than younger children on IMMA as a result of maturation (Gordon, 1986), the overall difference between the two groups in pre- and post-instruction IMMA mean scores are attributable to the age difference between the two groups. It is

also possible that the difference in the amount of instruction between the two grade levels may have contributed to this finding. Children in kindergarten received one hour less of instruction per cycle and one full year less of formal music instruction than children in first grade.

The Effect of Root Melody Accompaniment to Songs on the Tonal Achievement of Children in Kindergarten and First Grade

Means and Standard Deviations of Tonal Rating Scale – Tonality Dimension

The means and standard deviations of Tonality Dimension scores for the major and minor criterion songs are reported in Table 9. The combined experimental group major criterion song mean and minor criterion song mean are similar to, but slightly higher than, the combined control group mean. Similar means between grade levels and within grade levels were also found, with the experimental tendencies slightly higher than those of the control group except for the major song in grade one. Children in kindergarten received slightly lower scores than children in the first grade on both the major and minor criterion songs. The mean tonality score of the kindergarten experimental group was slightly higher than that of the kindergarten control group for the major and minor criterion songs. The mean trends of the first-grade experimental group and the first-grade control group were mixed.

The standard deviation for the experimental group with combined grade levels was similar to that of the control group for combined grade levels,

indicating similar variability of scores between the two groups for the major, minor, and composite tonality scores. The standard deviation for the kindergarten experimental group was comparable to that of the kindergarten control group, indicating similar variability of scores between the two groups. The standard deviation for the first-grade experimental group was slightly larger than that of the first-grade control group, indicating a greater variability of scores in the experimental group.

Table 9

Means Table of Tonality Scores

<u></u>	N	М	SD
Major Tonality			
Experimental Total	68	3.66	1.05
Control Total	68	3.56	1.02
SK, Experimental	34	3.64	.95
SK, Control	34	3.23	.99
1st, Experimental	34	3.68	1.14
1st, Control	34	3.88	.94
Minor Tonality			
Experimental Total	68	3.61	1.03
Control Total	68	3.46	1.02
SK, Experimental	34	3.47	1.02
SK, Control	34	3.25	1.06
1st, Experimental	34	3.76	1.04
1st, Control	34	3.67	.95

The means and standard deviations of the tonality composite scores are reported in Table 10. The combined experimental group tonality composite mean is slightly higher than the control group mean. The tonality composite mean of the kindergarten experimental group was slightly higher than that of the kindergarten control group. The mean of the first-grade experimental group was slightly lower than that of the first-grade control group.

Table 10

	<u>N</u>	М	SD	
Experimental Total	68	7.28	1.94	
Control Total	68	7.02	1.91	
SK, Experimental	34	7.11	1.88	
SK, Control	34	6.48	1.93	
1st, Experimental	34	7.44	2.02	
1st, Control	34	7.56	1.77	

Means Table of Tonality Composite Score

The standard deviation for the experimental group with combined grade levels was similar to that of the control group, with combined grade levels indicating similar variability of scores between the two groups. The standard deviation for the kindergarten experimental group was comparable to that of the kindergarten control group, indicating similar variability of scores between the two groups. The standard deviation for the first-grade experimental group was somewhat larger than that of the first-grade control group, indicating a greater variability of scores in the experimental group.

ANOVA of Tonality Scores

In order to determine whether the use of a root melody accompaniment in song instruction has an effect on kindergarten and first-grade children's abilities to sing tonic, dominant, subdominant and cadential patterns accurately within the context of a song, a two-way analysis of variance (treatment x grade) was conducted ($p \le .05$). Results for the major and minor tonality mean scores (see Table 11) and the tonality composite mean scores (see Table 12) indicated no significant interactions or differences as a result of treatment. As expected, there was a significant difference for the main effect of grade for the major tonality scores, minor tonality scores, and tonality composite scores.

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Table 11

ANOVA Table of Tonal Rating Scale - Tonality Dimension

df	SS	MS	F	р
1	.37	.37	.36	.55
1	4.06	4.06	3.97	.05*
1	3.15	3.15	3.08	.08
132	135.02	1.02		
1	.78	.78	.75	.39
1	4.34	4.34	4.19	.04*
1	.15	.15	.14	.71
132	136.77	1.04		
	<u>df</u> 1 1 1 132 1 1 1 132	df SS 1 .37 1 4.06 1 3.15 132 135.02 1 .78 1 4.34 1 .15 132 136.77	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

**p* ≤ .05

Table 12

ANOVA Table of Tonality Composite Score

• • • • • • • • • • • • • • • • • • •	df	SS	MS	F	p
Treatment	1	2.23	2.23	.62	.43
Grade	1	16.80	16.80	4.65	.03*
Treatment x Grade	1	4.67	4.67	1.29	.26
Residual	132	476.72	3.61		

**p* ≤ .05

Interpretation of the Tonality Score

Results indicated that no significant difference existed between the experimental and control groups. In this study, the addition of root melody accompaniment to songs did not have an effect on children's ability to sing tonic, dominant, subdominant and cadential patterns accurately within the context of a song. This finding supports the results of Atterbury & Silcox (1993), Petzold (1966), and Stauffer (1986) that harmonic accompaniment and instruction does not have an affect on children's singing accuracy.

The children in this study have had two years of informal music guidance that included rich listening experiences in all tonalities. It is possible that the acculturation process is sufficient in developing children's ability to sing within a tonality, so that the treatment had no effect.

Longer instructional periods allow children to achieve closer to their potential. Perhaps 25 weeks of root melody accompaniment with song instruction was not enough to affect children's ability to sing within a tonality, so again, the treatment had no effect. A longer treatment period may have resulted in significant differences.

Another possible reason that the addition of root melody accompaniment to song instruction did not have an effect on children's ability to accurately sing within a tonality of a song may have to do with developmental maturity. Children's ability to sing accurately within the tonality of a song may still be in the process of developing. If this is the case, the affects of root melody

accompaniment with song instruction will not be obvious until later in the developmental process.

From the analysis of the tonality scores, it was found that children in kindergarten scored significantly lower than the children in first grade for the combined control and experimental group and the control group alone. A factor that could be contributing to the difference is that older children score better than younger children by the advantage of age. In addition, children in first grade had one full year more of instruction than children in kindergarten. Furthermore, the difference in the amount of instruction received by the two grade levels may have contributed to this finding. Kindergarten children received one hour less of instruction per cycle than children in first grade.

Means and Standard Deviations of Tonal Rating Scale – Keyality Dimension

The means and standard deviations of the Keyality Dimension scores for the major and minor criterion songs are reported in Table 13. The combined experimental group major criterion song mean is similar to the combined control group mean scores. The combined experimental group minor criterion song mean is slightly higher than the combined control group mean scores. Similar means between grade levels and within grade levels were also found. Children in kindergarten received relatively the same score as children in the first grade on both songs. The keyality scores of the kindergarten experimental group were comparable to the kindergarten control group for the major song and were

slightly higher for the minor song. The means of the first-grade experimental group and the first-grade control group were similar.

Table 13

				·
	<u>N</u>	<u> </u>	<u>SD</u>	
Major Keyality				
Experimental Total	68	2.21	1.36	
Control Total	68	2.19	1.42	
SK, Experimental	34	2.12	1.22	
SK, Control	34	2.06	1.37	
1st, Experimental	34	2.29	1.49	
1st, Control	34	2.33	1.47	
Minor Keyality				
Experimental Total	68	2.29	1.28	
Control Total	68	1.92	1.19	
SK, Experimental	34	2.35	1.31	
SK, Control	34	1.73	1.12	
1st, Experimental	34	2.22	1.27	
1st, Control	34	2.12	1.24	

Means Table of Tonal Rating Scale - Keyality Dimension

The standard deviation for the experimental group with combined grade levels was similar to that of the control group with combined grade levels, indicating similar variability of scores between the two groups. The standard deviation for the kindergarten and first-grade experimental groups was comparable to that of the kindergarten and first-grade control groups, indicating similar variability of scores between the groups.

The means and standard deviations of the Keyality Composite scores are reported in Table 14. The combined experimental group composite keyality means are similar to the combined control group means, with a slight trend favoring the experimental group.

Table 14

- - - - - - - - - - 	N	М	<u>SD</u>
Experimental Total	68	4.49	2.43
Control Total	68	4.19	2.28
SK, Experimental	34	4.47	2.37
SK, Control	34	3.79	2.30
1st, Experimental	34	4.52	2.52
1st, Control	34	4.45	2.26

Means Table of Keyality Composite Score

Similar means between grade levels and within grade levels were also found, again with slight trends favoring the experimental and control groups and the older children. Children in kindergarten received nearly the same keyality composite scores as children in the first grade. The keyality composite mean of the kindergarten experimental group was slightly higher than that of the kindergarten control group. The mean of the first-grade experimental group and the first-grade control group were also similar. All mean trends, although slight, favored the experimental group.

The standard deviation for the experimental group with combined grade levels was similar to that of the control group with combined grade levels, indicating similar variability of scores between the two groups. The standard deviations for the kindergarten and first-grade experimental groups were comparable to the ones for the kindergarten and first-grade control groups, indicating similar variability of scores between the groups.

ANOVA of Keyality Scores

In order to determine whether the use of a root melody accompaniment in song instruction has an effect on kindergarten and first-grade children's ability to remain in the given keyality of a song, a two-way analysis of variance (treatment x grade) was conducted, and alpha was set at .05. Results for the major and minor criterion song ratings (see Table 15) and the keyality composite ratings (see Table 16) yielded no significant interactions or differences for the main effects of treatment or grade level. However, the difference between groups as a result of treatment approached significance for the minor keyality song.
Table 15

ANOVA Table of Tonal Rating Scale - Keyality Dimension

	df	SS	MS	F	p
Major Keyality					
Treatment	1	.01	.01	.00	.95
Grade	1	1.61	1.61	.83	.36
Treatment x Grade	1	.08	.08	.04	.84
Residual	132	256.53	1.94		
Minor Keyality					
Treatment	1	4.45	4.45	2.91	.09
Grade	1	.60	.60	.39	.53
Treatment x Grade	1	2.33	2.33	1.52	.22
Residual	132	201.76	1.53		

p > .05

Table 16

ANOVA Table of Keyality Composite Score

	df	SS	MS	F	p
Treatment	1	4.82	4.81	.86	.35
Grade	1	4.17	4.17	.75	.39
Treatment x Grade	1	3.24	3.24	.58	.45
Residual	132	737.51	5.59		

p > .05

Interpretation of the Keyality Scores

No significant difference existed between the experimental and control groups or between grade levels. The addition of a root melody accompaniment in song instruction did not have an effect on children's ability to remain in the given keyality of a song. This finding supports the results of Atterbury & Silcox (1993), Petzold (1966), and Stauffer (1986), who found that harmonic accompaniment does not have an affect on children's singing accuracy.

As with the previous interpretations, the children in this study have had two years of informal music guidance that included rich listening experiences in all tonalities. It is possible that the acculturation process is sufficient in developing children's ability to sing within the keyality of a song, regardless of treatment.

The minor keyality mean difference approached significance as a result of treatment. Children in the experimental group tended to receive higher ratings than children in the control group. Furthermore, the kindergarten experimental group tended to receive higher scores than the kindergarten control group. The same trend also occurred between the first-grade experimental group and the first-grade control group. A longer study investigating the effect of root melody accompaniment on children's ability to remain in the given keyality of a song might have yielded significant results.

From the analysis of the keyality scores, it was found that children in kindergarten received the same keyality mean scores as children in first grade – surprisingly, age appears not to be a factor. A possible explanation may be that

it is difficult for young children to remain in the given keyality of a song. The children's major and minor keyality means were lower than their tonality mean. They could audiate tonality but may need more experience before developing the ability to audiate keyality. Many of the children, when performing the criterion songs, were able to begin the songs in the given keyality but then strayed from it during the B section. Some children were able to regain the keyality again during the final A section of the songs. This conflicts with Gordon (1997a, 1997c), who states that children develop the ability to sing within the keyality of songs before they accurately sing within the tonality of songs.

Another explanation for the similarity of keyality scores between grade levels may be that the keyality dimension of the rating scale needs refinement, as it had the lowest reliabilities of all of the rating scales. This dimension of the rating scale could have been difficult for the judges and therefore did not serve as an adequate measure of the children's ability.

Another possibility for the similarity of keyality scores between grade levels is that there were different instructors for one of the grade levels. One teacher provided instruction for the children in all of the kindergarten classes and two of the first-grade classes. Two other teachers provided instruction for the children in one of the remaining two first-grade classes. Because no two teachers can teach exactly alike, the difference in instruction, as it related to keyality, may have been a factor. Therefore, no keyality performance difference between grade levels was found.

Means and Standard Deviations for Major and Minor Criterion Song Composite Scores

The means and standard deviations of the major and minor criterion song composite scores are reported in Table 17. The combined experimental group major and minor criterion song composite scores are slightly higher than those of the control group. Similar means between grade levels were also found, with a slight trend in favor of the older children. Children in kindergarten received nearly the same major and minor song composite scores as children in the first grade. The major and minor song means of the kindergarten experimental group were slightly higher than those of the kindergarten control group. The means of the first-grade experimental group and the first-grade control group were similar, slightly favoring the control group.

Table 17

|--|

	<u>N</u>	М	SD	
Major Song Composite				
Experimental Total	68	5.89	2.21	
Control Total	68	5.75	2.27	
SK, Experimental	34	5.77	2.00	
SK, Control	34	5.29	2.26	
1st, Experimental	34	5.99	2.43	
1st, Control	34	6.21	2.22	
Minor Song Composite				
Experimental Total	68	5.91	2.21	
Control Total	68	5.39	2.05	
SK, Experimental	34	5.84	2.26	
SK, Control	34	4.95	2.02	
1st, Experimental	34	5.98	2.19	
1st, Control	34	5.82	2.01	

The standard deviation for the experimental group with combined grade levels was similar to that of the control group with combined grade levels, indicating similar variability of scores between the two groups. The standard deviations for the kindergarten and first-grade experimental groups were comparable to the ones for the kindergarten and first-grade control groups, indicating similar variability of scores between the groups.

ANOVA of Major and Minor Criterion Song Composite Scores

In order to determine whether the use of a root melody accompaniment in song instruction has an effect on kindergarten and first-grade children's ability to sing a major and minor criterion song, a two-way analysis of variance (treatment x grade) was conducted, and alpha was set at .05. Results for the major and minor criterion song composite scores (see Table 18) indicated no significant interactions or difference for the main effects of treatment or grade level.

Table 18

	df	SS	MS	F	p
Major Song Composit	e				
Treatment	1	.45	.45	.09	.77
Grade	1	10.62	10.62	2.13	.15
Treatment x Grade	1	4.31	4.31	.86	.35
Residual	132	658.40	4.99		
Minor Song Composit	e				
Treatment	1	9.42	9.42	2.09	.15
Grade	1	8.70	8.70	1.93	.17
Treatment x Grade	1	4.67	4.67	1.04	.31
Residual	132	595.63	4.51		

ANOVA Table of Major and Minor Criterion Song Composite Scores

p > .05

Interpretation of Major and Minor Criterion Song Composite Scores

No significant difference existed between the experimental and control groups or between grade levels. In this study, the addition of a root melody accompaniment in song instruction did not have an effect on children's ability to sing a major and minor song accurately. This finding supports the results of Atterbury & Silcox (1993), Petzold (1966), and Stauffer (1986), who found that harmonic accompaniment does not have an affect on children's singing accuracy. Again, the children in this study have had two years of informal music guidance that included rich listening experiences in all tonalities. It is possible that the acculturation process is sufficient in developing children's ability to sing within the tonality of a song, regardless of treatment.

From the analysis of the major and minor criterion song composite scores, it was found that children in kindergarten received the same mean scores as children in first grade – again, age appears not to be a factor.

Means and Standard Deviations for Composite Tonal Achievement Scores

The means and standard deviations of the composite tonal achievement scores are reported in Table 19. The combined experimental group composite tonal achievement scores are similar to the combined control group scores, with a slight difference in favor of the experimental group. Similar means between grade levels and within grade levels were also found. Children in kindergarten received nearly the same composite tonal achievement score as children in the first grade, with a slight trend in favor of the older children. The composite tonal achievement mean of the kindergarten experimental group was similar to that of the kindergarten control group, with a trend in favor of the control group. The means of the first-grade experimental group and the first-grade control group were also similar.

Table 19

	<u>N</u>	М	SD
Experimental Total	68	11.78	4.16
Control Total	68	11.14	4.01
SK, Experimental	34	11.61	4.06
SK, Control	34	10.24	4.08
1st, Experimental	34	11.95	4.31
1st, Control	34	12.03	3.78

Means Table for Composite Tonal Achievement

The standard deviation for the experimental group with combined grade levels was similar to that of the control group with combined grade levels, indicating similar variability of scores between the two groups. Standard deviations for the kindergarten and first-grade experimental groups were comparable to the ones for the kindergarten and first-grade control groups, indicating similar variability of scores between the groups.

ANOVA of Composite Tonal Achievement Score

In order to determine whether the use of a root melody accompaniment in song instruction has an effect on kindergarten and first-grade children's overall tonal accuracy, a two-way analysis of variance (treatment x grade) was conducted, and alpha was set at .05. Results for the composite tonal

achievement scores (see Table 20) indicated no significant interactions or difference for the main effects of treatment or grade level.

Table 20

ANOVA	Table	of Tor	nal Achie	evement
	the second s			

 	df	SS	MS	F	p
Treatment	1	13.98	13.98	.85	.35
Grade	1	38.54	38.54	2.34	.13
Treatment x Grade	1	17.94	17.94	1.09	.30
Residual	32	2177.63	16.50		
·····				·	

p > .05

Interpretation of Tonal Achievement Composite Scores

No significant difference existed between the experimental and control groups or between grade levels. In this study, the addition of a root melody accompaniment in song instruction did not have an effect on children's tonal accuracy. Although Jarjisian (1983), and Richner (1976) found significant difference in tonal achievement related to instruction, Levinowitz (1987) did not. Furthermore, Atterbury & Silcox (1993), Petzold (1966), and Stauffer (1986) found no difference in the tonal accuracy of children who sang songs within a harmonic context and those who did not. It is possible that children cannot focus on more than one aspect of music at a time when singing. The focus may have been placed on the teacher's voice with little or no focus on the root melody accompaniment.

It is also possible that when informal early childhood music experiences provide a foundation of listening, children are able to sing more accurately later on. The process of music learning parallels the process of language learning (Gordon, 1990) - the larger the "listening" vocabulary, the larger the "speaking" vocabulary. Stamou (1999) found that Suzuki students who had informal music guidance in early childhood tended to receive higher ratings on intonation, rhythm, expression, and composite performance achievement scores than children who did not have such instruction. All children had completed two years of music instruction prior to participation in this study.

From the analysis of the tonal achievement composite means, it was found that children in kindergarten received the same scores as children in first grade - age again appears not to be a factor. Another possibility for the similarity of tonal achievement scores between grade levels is that there were different instructors for one of the grade levels. One teacher provided instruction for the children in all of the kindergarten classes and two of the first-grade classes. Two other teachers provided instruction for the children in one of the remaining two first-grade classes. Because no two teachers can teach exactly alike, the difference in instruction, as it related to keyality, may have been a factor. Therefore, no keyality performance difference between grade levels was found.

<u>The Effect of Root Melody Accompaniment to Songs on the</u> <u>Tonal Improvisations of Children in Kindergarten and First Grade</u>

Means and Standard Deviations for Improvisation Scores

The means and standard deviations of the improvisation scores are reported in Table 21. The combined experimental group improvisation scores are higher than the combined control group scores. Also, children in kindergarten received lower improvisation scores than children in first grade. In fact, the improvisation mean score of the kindergarten experimental group was higher than that of the kindergarten control group. The mean score of the firstgrade experimental group was higher than that of the first-grade control group.

The standard deviation for the experimental group with combined grade levels was similar to that of the control group with combined grade levels, indicating similar variability of scores between the two groups. Standard deviations for the kindergarten and first-grade experimental groups were comparable to those of the kindergarten and first-grade control groups, indicating similar variability of scores between the groups.

Table 21

Means Table for Improvisation Scores

	<u>N</u>	М	SD
Experimental Total	68	2.61	1.43
Control Total	68	1.97	1.41
SK, Experimental	34	2.61	1.43
SK, Control	34	1.97	1.41
1st, Experimental	34	3.11	1.43
1st, Control	34	2.58	1.27

ANOVA of Tonal Improvisation Scores

In order to determine whether the use of a root melody accompaniment in song instruction has an effect on kindergarten and first-grade children's tonal improvisations, a two-way analysis of variance (treatment x grade) was conducted, and alpha was set at .05. Results for the tonal improvisation scores (see Table 22) indicated no significant interactions. However, there were statistically significant differences for the main effects of treatment and grade level. Children in the experimental group received significantly higher improvisation ratings than children in the control group. The mean scores of children in first-grade were significantly higher than those of children in kindergarten.

Table 21

	df	SS	MS	F	<u>p</u>
Treatment	1	11.71	11.71	6.08	.01*
Grade	1	10.45	10.45	5.43	.02*
Treatment x Grade	1	.12	.12	.06	.80
Residual	32	254.23	1.93		

ANOVA Table of Improvisation Scores

**p* ≤ .05

Interpretation of Improvisation Scores

Children who received song instruction with root melody accompaniment achieved significantly higher tonal ratings when improvising than children who did not have such instruction. Implied harmonic functions within the original keyality and tonality occurred most often in the melodic improvisations of children in the experimental group. It is possible that, as it is with developing a listening vocabulary of tonalities, children need exposure to the sound of harmonic progressions within the context of familiar songs in order to build a harmonic "speaking" vocabulary. An observation made by one of the teachers participating in the study was that it was quite different hearing and singing the songs with the root melody accompaniment. She felt that the accompaniment "brought the song to life" in the sense that when she sang the song without the root melody, she could clearly hear the progression within the melody. Teachers of young children are aware of children's appearance that they are not paying attention,

but then those same children retain and display every bit of information at a later time. This may be the case with improvisation. Although attention was never brought to the root melody accompaniment, children were able to bring that aspect into their improvisations. Listening to the bass line helped children develop a sense of how melodies combine to create harmony and how tones function within the harmony. It is familiarity and comfort with chord changes that is the compelling factor in children's ability to improvise (Gordon, 2001).

From the analysis of the improvisation scores, it was found that children in kindergarten scored significantly lower than the children in first grade. A factor that could be contributing to the difference is that, because older children score better than younger children by the advantage of age alone, the overall difference between the two groups in improvisation mean scores are attributable to maturation. Or, it may have been because children in kindergarten received one hour less of instructional time per cycle than children in first grade. Children in kindergarten also had one full year less of formal music instruction than children in first grade.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A summary of the study is presented in this chapter. Conclusions and implications for music education are also included, followed by recommendations for future research.

Summary of the Study

Purpose and Problems

The purpose of this research was to examine the effect of harmonic accompaniment on the developmental tonal aptitude, tonal achievement, and tonal improvisations of young children. The specific problems of this study were the following:

- Does the addition of a root melody accompaniment to song instruction affect the developmental tonal aptitude of children in kindergarten and first grade?
- 2) Does the addition of a root melody accompaniment to song instruction affect the tonal achievement of children in kindergarten and first grade?
- 3) Does the addition of a root melody accompaniment to song instruction affect the tonal strength of the improvisations of children in kindergarten and first grade?

Design and Procedures

The design of this study was treatment by levels. The two treatments were songs with no harmonic accompaniment and songs with harmonic accompaniment. The two levels were grade in school (kindergarten and first).

Sixty-eight kindergarten students and 68 first grade students (N = 136) from an independent private school participated in the study. The children in this study were from four intact kindergarten classes (17 students per class) and four intact first grade classes (17 students per class). The students received a total of twenty-five weeks of instruction. Children in kindergarten received 30-minutes of formal music instruction twice per six-day instructional cycle. The children in first grade received 40-minutes of formal music instruction three times per cycle.

Music instruction for all children in this study was based on Gordon's Music Learning Theory and included pattern instruction, identification of tonalities and meters, identification of pattern functions, improvisation, singing, chanting, movement, and playing instruments. For the treatment group (two kindergarten and two first grade classes), a root melody accompaniment was used with the rote songs in each instructional period. The control group (two kindergarten and two first grade classes) did not have root melody accompaniment with the rote songs sung in class. Other than the use of root melodies, all children received the same instructional content.

The Intermediate Measures of Music Audiation was administered prior to instruction and then again after instruction ended. Both the *Tonal* and *Rhythm*

subtests were administered but only the *Tonal* subtest was used as a dependent variable.

The two criterion songs were taught to all children four weeks before testing began. Within two weeks following the completion of instruction, each individual student met with the researcher to perform the two criterion songs without text, one in major tonality/duple meter and one in minor tonality/duple meter, and to improvise an ending to a major tonality/duple meter song without text. All singing was performed without root melody accompaniment. All of the performances were audio-taped and used for analysis.

Three independent judges were used to rate the children's singing. They rated both of the criterion songs using a five-point continuous rating scale with two dimensions - tonality and keyality. The improvisations were rated using a five-point continuous rating scale. All of the judge's ratings were used in the analysis.

Results and Interpretations

Split-halves reliabilities for the pre- and post-instruction administration of the *Tonal* subtest of IMMA were, in general, slightly higher than the ones reported in the IMMA Manual (Gordon, 1986). However, split-halves reliability for the first-grade post-instruction administration of IMMA was slightly lower than the ones reported in the IMMA Manual. Interjudge reliabilities between the three judges ranged from .66 to .93 for the Tonal and Improvisation rating scales. The

reliability coefficients ranged from moderate to high, and the ratings were considered reliable.

In this study, song instruction with root melody accompaniment did not have an effect on the developmental tonal aptitude of children in kindergarten and first-grade. No significant difference was found between children in the treatment group and the control group. This could be a result of several factors. Perhaps the *Tonal* subtest of IMMA was too easy for the children in this study. The post-instruction tonal aptitude mean scores were well above the mean reported in the test manual (Gordon, 1986). In fact, the lower split-halves reliability of the post-instruction administration for children in first grade may have been a result of the test being too easy. Another explanation for the results may be that the children's developmental tonal aptitude score increased as a result of age. It is also possible that song instruction with root melody accompaniment has no effect on developmental tonal aptitude.

Also, it is possibly a result of the children in this study having received two years of informal music guidance prior to the study, resulting in levels of aptitude that are so high there is no room for growth. The high aptitude levels found in this study may be, in part, the result of the rich and varied listening vocabulary children gained as a result of this informal guidance. Another aspect of informal guidance and formal music instruction that may have supported the developmental tonal aptitudes of the children in the present study is individualized instruction. Knowing the tonal strengths and weakness of

individual children and individualizing instruction to meet these needs helps children to realize their music potential.

Parental involvement in music was extremely high at this particular school and participation in music activities was encouraged and supported through the home and school environment. This, too may have resulted in unusually high aptitude scores.

Another explanation for this finding is that children cannot attend to two voices at one time – simpler may be better. If this were the case, song instruction with root melody accompaniment would not have had an effect on developmental tonal aptitude.

In the analysis of the pre-instruction and post-instruction IMMA tonal aptitude scores by age-level, it was found that children in kindergarten scored significantly lower than the children in first grade. Because older children score better than younger children on IMMA as a result of maturation (Gordon, 1986), the overall difference between the two groups in pre- and post-instruction IMMA mean scores probably is attributable to the age difference between the two groups. It is also possible that the difference in the amount of instruction between the two grade levels may have contributed to this finding. Children in kindergarten received one hour less of instruction per cycle than children in first grade. Also, children in first grade had one full year more of formal music instruction than children in kindergarten.

Song instruction with root melody accompaniment did not have an effect on the tonal achievement of children in kindergarten and first-grade as a result of

treatment. Results indicated that no significant difference existed between the experimental and control groups for the 1) major, minor, and composite tonality scores, 2) major, minor, and composite keyality scores, 3) major and minor criterion song composite scores, and 4) the tonal achievement composite scores. This finding supports the results of Atterbury & Silcox (1993), Petzold (1966), and Stauffer (1986) that harmonic accompaniment and its use in instruction does not have an affect on children's singing accuracy. Longer instructional periods allow children to achieve closer to their potential. Perhaps 25 weeks of song instruction with root melody accompaniment was not enough to affect children's ability to sing with accuracy.

Another possible reason song instruction with the addition of root melody accompaniment did not have an effect on children's vocal achievement may have to do with developmental maturity. Children's ability to sing accurately may still be in the process of developing. If this is the case, the effects of song instruction with root melody accompaniment will not be obvious until later in the developmental process.

The minor keyality score differences approached significance as a result of treatment. Children in the experimental group tended to receive higher ratings than children in the control group. Furthermore, the kindergarten experimental group tended to receive higher mean scores than the kindergarten control group. The same trend also occurred between the first-grade experimental group and the first-grade control group. Perhaps with a more extended study, the differences would have been significant.

From the analysis of the major, minor, and composite tonality scores and major keyality scores, it was found that children in kindergarten scored significantly lower than the children in first-grade. A factor that could be contributing to the difference is that older children score better than younger children by the advantage of age alone. Also, as before, the difference in the amount of instruction received by the two grade levels may have contributed to this finding.

It was found that no difference exists between children in kindergarten and first-grade children for the 1) major, minor, and composite keyality scores, 2) major and minor criterion song composite scores, and 3) tonal achievement composite scores. Children in kindergarten received the same mean scores as children in first grade – surprisingly, age appears not to be a factor. A possible explanation for the keyality mean scores may be that it is difficult for young children to remain in the given keyality of a song. They can audiate tonality but may need more experience before developing the ability to audiate keyality. Many of the children, when performing the criterion songs, were able to begin the songs in the given keyality but then strayed from it during the B section. Some children were able to regain the keyality again during the final A section of the songs. Although Gordon (1997a, 1997c) states that children develop the ability to sing within the keyality of songs before they accurately sing within the tonality of songs, that did not appear to be the case in this study.

Another explanation for the similarity of keyality, criterion song, and tonal achievement mean scores between grade levels may be that the keyality

dimension of the rating scale needs refinement, as it had the lowest reliabilities. This dimension of the rating scale may have been difficult for the judges and therefore did not serve as an adequate measure of the children's ability. One bad dimension will affect the composite score. Perhaps the keyality dimension needs modification for future use.

Another possibility for the similarity of keyality scores between grade levels is that there were different instructors for one of the grade levels. One teacher provided instruction for the children in all of the kindergarten classes and two of the first-grade classes. Two other teachers provided instruction for the children in one of the remaining two first-grade classes. Because no two teachers can teach exactly alike, the difference in instruction, as it related to keyality, may have been a factor. Therefore, no keyality performance difference between grade levels was found.

Song instruction with root melody accompaniment did have an effect on the vocal improvisations of children in kindergarten and first-grade. Children in the experimental group received significantly higher improvisation scores than children in the control group. Implied harmonic functions within the original keyality and tonality occurred most often in the melodic improvisations of children in the experimental group. It is possible that children need exposure to the sound of harmonic progressions within the context of familiar songs in order to build a harmonic "speaking" vocabulary. Listening to the bass line helped children develop a melodic sense of how melodies combine to create harmony, and how tones function within the harmony. Tonal improvisation is most

meaningfully accomplished when the improvisor is audiating a harmonic context (Gordon, 1997b & 1998b). In addition, as would be expected, children in kindergarten received significantly lower improvisation scores than children in the first-grade.

Conclusions and Implications for Music Education

Several conclusions about the use of root melody accompaniment with song instruction can be reached as a result of this study. Results relating to the effect of song instruction with root melody accompaniment on the developmental tonal aptitude of children in kindergarten and first grade revealed only trends in the way song instruction with root melody accompaniment influences developmental tonal aptitude. The results were non-significant, and therefore, further research is needed to verify them so that conclusive findings are established and generalization is possible.

Trends found in this study suggest that song instruction including root melody accompaniment may support developmental tonal aptitude more than song instruction without root melody accompaniment. Understanding the organization and functions of melody may occur at deeper levels when the bass lines to songs are present. Teachers should consider presenting a portion of rote songs with root melody accompaniment.

Trends found in this study suggest that song instruction including root melody accompaniment may support children's tonal achievement more than song instruction without root melody accompaniment. A teacher who models

accurate singing may have more influence on children's singing accuracy when using root melody accompaniments with song instruction.

An important observation was made with regard to instruments used to accompany a child's singing. The piano, soprano metalophone, soprano xylophone, alto metalophone, alto xylophone, and tape-recorded voice worked well for the root melody accompaniments. However, this researcher and the other teacher of the treatment group noticed that, when the glockenspiel was used as an accompanying instrument, the children became confused. They seemed unclear as to whether they should sing the root melody or whether they should sing the song. This did not occur with the other instruments or for the tape-recorded voice. Because it caused children some difficulty, it was decided that the glockenspiel would not be used for the remainder of the study, and perhaps teachers should avoid using the instrument in this way as well.

Regarding the effect of song instruction with root melody accompaniment on tonal improvisations, children who have had song instruction with root melody accompaniment improvise better than those children who have not had such instruction. Because of this, it seems important for teachers to include at least some song instruction with root melody accompaniment if they are interested in helping children become better improvisers.

Recommendations for Future Research

Results of the present study suggested that song instruction with root melody accompaniment may facilitate the development of tonal aptitude more

than song instruction without root melody accompaniment. Although this was a consistent tendency, results did not reach significance. Further investigations of the effect of song instruction with root melody accompaniment on developmental tonal aptitude might include the following: (1) a more appropriate aptitude test for children who have outgrown IMMA; (2) a different population of children with whom IMMA (or PMMA) is the appropriate aptitude test; (3) different age-groups to provide insight on issues relating to maturation; (4) use of an harmonic aptitude test as a grouping and independent variable; (5) one teacher for all of the children in the study or different teachers with equal numbers of children; and/or (6) a longitudinal study to determine long term affects of song instruction with root melody accompaniment on developmental tonal aptitude.

The present study has shown that the instructional treatment tended to increase children's tonal accuracy. Song instruction with root melody accompaniment may be a matter of developmental maturity. For the children in this study, the ability to sing accurately may be in the process of developing. If this is the case, the affects of root melody accompaniment with song instruction will not be obvious until later in the developmental process. A longer treatment period may allow singing accuracy to develop over time, possibly showing different results than the ones found in this study. Future research might include a longitudinal study of a group of children or perhaps a cross-sectional study with a wider span of age-groups.

Results regarding children's ability to sing in the given keyality showed that maintaining keyality was difficult for children in kindergarten as well as

children in first grade. Gordon (1997a, 1997c) states that children develop the ability to sing within the keyality of songs before they sing accurately within the tonality of songs. The present study found the opposite. More research is needed so that a better understanding of children's ability to accurately sing the keyality of a song can be obtained. Future research might also include a revision of the keyality dimension of the Tonal Rating Scale. Atterbury and Silcox (1993) suggest that the narrow range of their rating scale might have accounted for the lack of significant differences in their study and recommend the use of a more specific measure. The keyality dimension may not have been an accurate measure, which ultimately would have affected the remaining criterion song composite and tonal achievement scores.

Results of the present study showed that song instruction with root melody accompaniment positively affects the improvisations of young children. As a result of treatment, children are more able to perform improvisations with harmonic functions that underpin the melody while maintaining keyality and tonality throughout. Future research could move in several directions. Certain harmonic progressions may be more beneficial to children's developing improvisation skills than others. It would be advantageous for music educators to investigate the type and sequence of root melody accompaniments most helpful in cultivating children's improvisational ability. Should one begin with root melodies consisting solely of tonic and dominant chord functions and then gradually add other chord roots to the progression? Is tonic and dominant the

best harmonic progression to use initially or would tonic and subdominant be a better choice?

Alvarez (1980a & 1980b) found that seventh-grade, eighth-grade, and college students identified harmonic progressions better with the scalar harmonic technique than with the root melody technique. Would young children improvise better with song instruction that included scalar harmonic accompaniment or song instruction that included root melody accompaniment?

Gordon (1998) found that the *Harmonic Improvisation Readiness Record* and the *Rhythm Improvisation Readiness Record* was evidence of harmonic aptitude. Future research might investigate if improvisation achievement has to do more with song instruction that includes root melody accompaniment or has it more to do with harmonic improvisation aptitude?

Future research might also include a longitudinal study of the effect of song instruction with root melody accompaniment on children's improvisations. Informal guidance is a time for children to build a rich listening vocabulary. How would a large listening vocabulary of bass lines affect children's future improvisations?

Improvisation is a window into a child's understanding of music. The importance of improvisation as a valuable music skill should be more than a notation in the National Standards for Arts Education (1994). Music educators should (1) seek out information to help themselves develop improvisational skills, (2) find the most productive means possible to help children become competent improvisers, and (3) actively pursue ways to make improvisation a vital part of

the curriculum so that children leave music programs with the skills they need to create music of their own. Using root melody accompaniment with song instruction is one way to facilitate the above. Hearing the bass lines to a variety of songs is an important component in the development of improvisational skills.

APPENDICES

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APPENDIX A

UCRIHS Permission

MICHIGAN STATE

UNIVERSITY

September 4, 2001

TO: Cynthia TAGGART 204 Music Bldg.

RE: IRB# 01-570 CATEGORY: EXPEDITED 2-F

APPROVAL DATE: September 4, 2001

TITLE: THE EFFECTS OF HARMONIC ACCOMPANIMENT ON THE DEVELOPMENTAL TONAL APTITUDE AND TONAL ACHIEVMENT OF KINDERGARTEN AND FIRST GRADE STUDENTS

The University Committee on Research Involving Human Subjects' (UCRIHS) review of this project is complete and I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project.

RENEWALS: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Projects continuing beyond one year must be renewed with the green renewal form. A maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for a complete review.

REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB# and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.

PROBLEMS/CHANGES: Should either of the following arise during the course of the work, notify UCRIHS promptly: 1) problems (unexpected side effects, complaints, etc.) involving human subjects or 2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of further assistance, please contact us at (517) 355-2180 or via email: UCRIHS@msu.edu. Please note that all UCRIHS forms are located on the web: http://www.msu.edu/user/ucrihs

University Committee en Research lavolving Human Subjects

GRADUATE

STUDIES

OFFICE OF

AND

Michigan State University 246 Administration Building East Lansing, Michigan 48824-1046 517/355-2180 FAX: 517/353-2976 Web: www.mau.edu/Laer/Auchis E-Mail: ucritis@msu.edu

> The Alichigan State University (DEA is institutional Diversity: Excellence in Action (ACC1 is on allocation automatics)

Sincerely,

Ashir Kumar, M.D. UCRIHS Chair

AK: bd

cc: Denise Guilbault 3060 Stratford St. Flint, MI 58504

APPENDIX B

Letter to Parents

September 4, 2001

Dear Parents,

The purpose of this letter is to ask permission for your child to participate in my dissertation on "An Investigation of the Effect of Harmonic Accompaniment on the Developmental Tonal Aptitude, Tonal Achievement, and Improvisations of Children in Kindergarten and First Grade." This dissertation is a requirement for the degree of Doctor of Philosophy that I am currently pursuing at Michigan State University.

In order to improve formal music instruction, the purpose of this study is to examine the effect of the use of harmonic accompaniment on the developmental tonal aptitude, tonal achievement, and improvisations of children in kindergarten and first grade. Specifically, this research will focus on the following: 1) Does the addition of a root melody accompaniment to songs affect the developmental tonal aptitude of children in kindergarten and first grade? 2) Does the addition of a root melody accompaniment to songs affect the song performance accuracy of children in kindergarten and first grade? 3) Does the addition of a root melody accompaniment to songs affect the tonal improvisations of children in kindergarten and first grade?

The study will be conducted throughout this school year during your child's regularly scheduled music class. Two procedures will be essential for this study. First, the Intermediate Measures of Music Audiation will be administered as a pretest and posttest measure of the children's music aptitude. The children are quite familiar with this test as this is a regular procedure that is used to keep track of their progress. Second, it will be necessary to audiotape your child's singing in order to accurately record his or her tonal achievement. The audio taping will occur at the end of the study in April. The audiotapes will also be used for analysis by three independent judges.

All aspects of your child's involvement will be kept confidential. The only persons viewing the tapes will be the judges and myself. The judges will know the children only by an assigned number; they will not know your child's name. Participation is entirely voluntary, and confidentiality of participants will be protected. You can indicate your approval by signing and returning the attached consent form. Once you have given written permission, the study will be explained to your child. If you have any questions about this study, please call

me at (248) 645-3507. You may also contact the Chair of the University Committee on Research Involving Human Subjects (UCRIHS) Dr. Ashir Kumar at (517) 355-2180 for questions about participants' rights as human subjects of research.

Please know that your child will receive excellent instruction during the study and will grow musically as the year progresses. Classes will run as usual with the exception that two kindergarten and two first grade classes will have the addition of harmonic accompaniments to the songs they sing. Through this research, I hope to gain some insight into factors that may facilitate the tonal development of young children and to improve my ability to guide children toward a deep understanding of music through audiation.

Sincerely,

Denise Guilbault Early Childhood Music Development Specialist Cranbrook Schools - Brookside

APPENDIX C

Parental Consent Form

Parental Consent Form

Please return this form to your child's teacher by **Wednesday, September 12, 2001** if you consent to your child's participation in this study.

Before signing, please read the attached page describing "An Investigation of the Effects of Harmonic Accompaniment on the Developmental Tonal Aptitude, Tonal Achievement, and Improvisations of Kindergarten and First Grade Children." Your child's participation in this study is voluntary and will remain confidential. Verbal assent will be obtained from your child as a precondition of participating in this study, and your child's name will not appear in any report of results. Students who do not choose to participate will not be penalized and they may choose to stop their participation at any time without penalty. When this study is completed, the overall results of it will be made available to you upon your written request.

Within these restrictions, I agree to allow my child to participate in this research study.

Child's Name: _____

Child's Birth Date: _____

Parent or Legal Guardian's Signature:

Today's Date: _____

APPENDIX D

Song Repertoire

Major/Duple

America The Beautiful	JRI-BK 1
Billy Billy	0
Brookside, Our School	0
Circle Round the Zero	0
Cotton Songs	0
Criterion Song #1	Guilbault
Hayride	0
Here Comes Sally	0
Jingle Bells	O
Love Somebody	JRI-BK 1
Orff Instrument Rondo	0
Paw Paw Patch	0
Thanksgiving	O
Yellow Brick Road	O

Major/Triple

America	JRI-BK 2
Circle Around	JRI-BK 2
O, How Lovely Is the Evening	JRI-BK 2

Major/Unusual

Top of My Head	ad a	
TOP OF My ried	au	JRI-DR I

Harmonic Minor/Duple

Boo	0
Criterion Song #2.	Guilbault

Harmonic Minor/Triple

Mother Sent Me	JRI-BK 1
Scandinavian Folk Song	JRI-BK 2
Temptation	0

Dorian/Triple

Matthy Groves/Little M	usgraveJRI-BK 1
The Lumberjack Song	JRI-BK 2

Phrygian/Duple

Phrygian/Multimetric

Song of the Pirates	JRI-BK 1
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Lydian/Duple

In the Morn	.Guilbault
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Lydian/Triple

Hello	to You	Guilbault
Peas		JRI-BK 2

Mixolydian/Triple

The Robin's Last Wil	JRI-BK 2
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Mixolydian/Unusual

Hello Everyone	Guilbault
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Aeolian/Duple

Follow the Drinkin' Gourd	IO
Hag Asif/Harvest Song .	0

Aeolian/Triple

Skin	and	Bones	JRI-BK 1	ł
O Rail	ana	001100		•

Aeolian/Unusual

Dance fr	om Tsakonia	⊨JRI-BK 2

Multitonal/Duple

Swedish Folk Song JRI-BK 2

JRI - BK 1

Taggart, C., Bolton, B., Reynolds, A., Valerio, W, & Gordon, E.E. (2000). *Jump right in: The music curriculum*. Chicago: GIA Publications.

JRI - BK 2

Bolton, B., Taggart, C., Reynolds, A., Valerio, W, & Gordon, E.E. (2001). *Jump right in: The music curriculum*. Chicago: GIA Publications.

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Other Sources

APPENDIX E

Sample of Senior Kindergarten Lesson Plans

Lesson Plan 3B

- 1) Hello Everyone (Mixolydian/Unusual)
- 2) Vocal Warm-Up
- 3) LSA Tonal Unit 1-B-1
- 4) The Lumber Camp Song (Dorian/Triple)
 - treatment group with root melody accompaniment (bass xylophone)
 - without text
 - four beat pattern with rhythm sticks tap on floor, tap together, flick twice in the air
 - sing resting tone (Re)
- 5) In The Morn (Lydian/Duple)
 - treatment group with root melody accompaniment (piano)
 - without text
 - individual bean bag toss to macrobeats and microbeats
 - group/individuals sing
- 6) Rolling (Triple Meter)
 - with movement
 - count # of times they hear first pattern
 - find part that is different from first pattern
 - individuals improvise during middle section
- 7) Hag Asif (Aeolian/Duple)
 - treatment group with root melody accompaniment (piano)
 - without text
 - rote song procedure
 - CFM during A section; macrobeats during B section
 - Group/individuals sing
- 8) Goodbye Everyone (Mixolydian/Unusual)
Lesson Plan 10B

- 1) Hello Everyone (Mixolydian/Unusual)
- 2) LSA Rhythm Unit 2-A-1
- 3) Vocal Warm-Up
- 4) Swedish Folk Song (Multitonal/Duple)
 - treatment group with root melody accompaniment (alto xylophone)
 - without text
 - hold hands horizontally and alternate top hands to macrobeats
 - repeat using microbeats
 - group sings

5) Mother Sent Me (Harmonic Minor/Triple)

- treatment group with root melody accompaniment (alto xylophone)
- without text
- group sings song stop at last two measures
- ask individual children to improvise a new ending to the song (last two measures)
- 6) O, How Lovely is the Evening (Major/Triple)
 - treatment group with root melody accompaniment (alto xylophone)
 - without text
 - rote song procedure

7) Circle Round the Zero (Major/Duple)

- dance
- with text
- 8) Goodbye Everyone (Mixolydian/Unusual)

Lesson Plan 15B

- 1) Hello Everyone (Mixolydian/Unusual)
- 2) Vocal Warm-Up
- 3) LSA Tonal Unit 3-B-1
- 4) Criterion Song #2 (Harmonic Minor/Duple)
 - treatment group with root melody accompaniment (bass metallophone)
 - without text
 - identify tonality
 - find # of tonic functions (La Mi Do)
 - teacher sings song children audiate/sing the tonic function patterns
- 5) Peas (Lydian/Triple)
 - treatment group with root melody accompaniment (bass metallophone)
 - without text
 - bilateral/alternating movements to macrobeat using rhythm sticks
- 6) Criterion Song #1 (Major/Duple)
 - treatment group with root melody accompaniment (bass metallophone)
 - with text
 - count # of dominant functions (Ti So Fa Re)
 - teacher sings song children audiate/sing the dominant function pattern
 - individuals sing

7) Love Somebody (Major/Duple)

- treatment group with root melody accompaniment (bass xylophone)
- without text
- ask individuals to improvise tonic pattern
- 8) Goodbye Everyone (Mixolydian/Unusual)

APPENDIX F

Sample of First-Grade Lesson Plans

Lesson Plan 3B

- 1) Hello Everyone (Mixolydian/Unusual)
- 2) LSA Rhythm Unit 3-B-1
- 3) Vocal Warm-Up
- 4) America (Major/Triple)
 - treatment group with root melody accompaniment (bass metallophone)
 - with text/rote song procedure

5) Hayride (Major/Duple)

- treatment group with root melody accompaniment (bass metallophone)
- with text
- on macrobeats tap ground in front then ground on front of person to the right
- identify beginning pitch (Mi) and last pitch (Do)
- identify meter

6) The Lumber Camp Song (Dorian/Triple)

- treatment group with root melody accompaniment (bass metallophone)
- without text
- four beat pattern with rhythm sticks tap on floor, tap together, flick twice in the air
- ask individual children to improvise new tonic function ending
- 7) Hag Asif (Aeolian/Duple)
 - treatment group with root melody accompaniment(bass metallophone)
 - with text
- 8) Brookside Our School (Major/Duple)
 - treatment with bass metallophone
 - with text
- 9) Goodbye Everyone (Mixolydian/Unusual)

Lesson Plan 10B

- 1) Hello Everyone (Mixolydian/Unusual)
- 2) LSA Rhythm Unit 4-A-1
- 3) Vocal Warm-Up
- 4) Swedish Folk Song (Multitonal/Duple)
 - treatment group with root melody accompaniment (alto xylophone)
 - without text
 - hold hands horizontally and alternate top hands to macrobeats
 - repeat using microbeats
 - group sings

5) Mother Sent Me (Harmonic Minor/Triple)

- treatment group with root melody accompaniment (alto xylophone)
- without text
- group sings song stop at last two measures
- ask individual children to improvise a new ending to the song (last two measures)
- 6) O, How Lovely is the Evening (Major/Triple)
 - treatment group with root melody accompaniment (alto xylophone)
 - without text
 - children sing resting tone ostinato on macrobeat
 - half of the group sings ostinato while the other half of the group sings the song

7) Billy, Billy (Major/Duple)

- dance
- with text
- 8) Goodbye Everyone (Mixolydian/Unusual)

Lesson Plan 15B

- 1) Hello Everyone (Mixolydian/Unusual)
- 2) LSA Rhythm Unit 4-A-1
- 3) Vocal Warm-Up
- 4) Love Somebody (Major/Duple)
 - treatment group with root melody accompaniment (bass metallophone)
 - without text
 - ask individuals to improvise dominant pattern
- 5) Peas (Lydian/Triple)
 - treatment group with root melody accompaniment (bass metallophone)
 - without text
 - create bilateral/alternating movements to macrobeat using rhythm sticks
 - individuals sing

6) Criterion Song #2 (Harmonic Minor/Duple)

- treatment group with root melody accompaniment (bass metallophone)
- without text
- identify tonality
- find # of tonic functions (La Mi Do)
- teacher sings song children audiate/sing the tonic function patterns

7) Cotton Songs (Major/Duple)

- treatment group with root melody accompaniment (bass metallophone)
- without text
- rote song procedure

8) Goodbye Everyone (Mixolydian/Unusual)

APPENDIX G

Verbal Assent Script

"I asked you here to sing two songs that we learned in class. I will also ask you to make up your own ending to a song. Your singing will be recorded onto this tape recorder. Before we can begin, I need to know if this is something you would like to do. I will give you a moment to think about it. When you are ready, say "yes" if you would like to sing the songs or say "no" if you would not like to sing the songs."

APPENDIX H

Improvisation Antecedent Phrase



APPENDIX I

Criterion Songs





APPENDIX J

Preparatory Sequences





APPENDIX K

Tonal subtest of Intermediate Measures of Music Audiation Test Form



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APPENDIX L

Tonal Achievement Rating Scale

Dimension 1: Tonality

- 5. The child sings most tonic, dominant, subdominant or cadential patterns in tune.
- 4. The child sings some tonic, dominant, subdominant or cadential patterns in tune.
- 3. The child tonicizes one pitch, and sings intervals away from that pitch with correct melodic direction.
- 2. The child sings small deviations around a pitch center.
- 1. The child uses a speaking voice.

Dimension 2: Keyality

- 5. Keyality is maintained throughout the entire song.
- 4. Keyality is maintained throughout the A, first A', and one of the two remaining sections.
- 3. Keyality is maintained throughout the A and first A' sections.
- 2. Keyality is maintained throughout the A section.
- 1. Keyality is immediately lost.

APPENDIX M

Improvisation Rating Scale

Dimension: Tonal Strength

- 5. Maintains keyality and tonality throughout the entire song.
- 4. Harmonic functions underpin melody; keyality and tonality are maintained throughout most but not all of the song.
- 3. Clarity of a tonal center wavers on an occasional section of the song and harmonic functions are unclear.
- 2. A tonal center is clear only occasionally.
- 1. No sense of a tonal center at any point in the song.
- 0. The child does not improvise.

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