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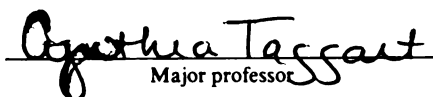
The Comparative Effects of the
Traditional Taiwanese Curriculum and A
Curriculum Based on Music Learning Theory on
the Developmental Music Aptitudes and Singing
Performance of First Grade Students in Taiwan

Presented By

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has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Music Education


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THE COMPARATIVE EFFECTS OF THE TRADITIONAL TAIWANESE
CURRICULUM AND A CURRICULUM BASED ON MUSIC LEARNING THEORY
ON THE DEVELOPMENTAL MUSIC APTITUDES AND SINGING
PERFORMANCE OF FIRST GRADE STUDENTS IN TAIWAN

By

Tao-Bin Yang

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ABSTRACT

THE COMPARATIVE EFFECTS OF THE TRADITIONAL TAIWANESE CURRICULUM AND A CURRICULUM BASED ON MUSIC LEARNING THEORY ON THE DEVELOPMENTAL MUSIC APTITUDES AND SINGING PERFORMANCE OF FIRST GRADE STUDENTS IN TAIWAN

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The purpose of the study was to investigate the effects of the use of the traditional music instruction and a Music Learning Theory-based instruction on the development of the music aptitudes and singing performance of Taiwanese first grade students. The problems were: (a) to determine whether Taiwanese first grade students who receive a Music Learning Theory-based curriculum will have different tonal aptitude scores on PMMA than students who receive instruction using the traditional Taiwanese curriculum; (b) to determine whether Taiwanese first grade students who receive a Music Learning Theory-based curriculum will have different rhythm aptitude scores on PMMA than students who receive instruction using the traditional Taiwanese curriculum; (c) to determine whether Taiwanese first grade students who receive a Music Learning Theory-based curriculum will demonstrate different levels of singing achievement than students who receive instruction using the traditional Taiwanese curriculum; and (d) to compare Taiwanese first grade students' PMMA scores to those of standardization norms as reported in the PMMA Manual.

Four intact Taiwanese first grade classes were the sample for this study. Two classes were randomly assigned to the control group and the other two to the experimental group. The control group received music instruction primarily based on the traditional Taiwanese curriculum. The experimental group received instruction based on Music Learning Theory. All students were pre- and post-tested using PMMA.

Instruction occurred for 12 weeks and consisted of one 40-minute class period per week. At the end of the instructional period, in addition to the PMMA posttest, students were audio-taped performing one criterion song. Students' singing performances were rated by three independent judges using an investigator-designed rating scale.

Students who received instruction based on Music Learning Theory achieved significantly greater gains in their developmental rhythm aptitude than students who received instruction using the traditional Taiwanese curriculum. There was no significant difference between the control group and the experimental group for developmental tonal aptitude and singing performance. Taiwanese first grade students scored significantly lower on the PMMA tonal subtest than American first grade students, as reported in the PMMA Manual. The developmental rhythm scores for Taiwanese first grade students were lower than American first grade students. However, the difference was not significant.

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TAO-BIN YANG

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To my parents and my wife
for their inspiration and support in all my endeavors

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TABLE OF CONTENTS

LIST OF TABLES.....	x
LIST OF FIGURES.....	xi
 CHAPTER 1	
RESEARCH BACKGROUD.....	1
Music Aptitude.....	2
The Difference Between “Method” and “Technique” in Music Education	3
The Philosophies and Methods of Major Music Approaches: Dalcroze, Orff, Kodály, and Gordon.....	6
The Dalcroze Approach.....	7
The Orff Approach.....	9
The Kodály Approach.....	11
Gordon’s Music Learning Theory.....	13
Audiation.....	17
Types of Audiation.....	18
Stages of Audiation.....	19
Levels and Sublevels of Skill Learning Sequence.....	20
Discrimination and Inference Learning.....	22
Aural/Oral.....	24
Verbal Association.....	24
Partial Synthesis.....	25
Symbolic Association.....	25
Composite Synthesis.....	25
Generalization.....	26
Creativity/Improvisation.....	26
Theoretical Understanding.....	27
Whole-Part-Whole Theory.....	27
Classroom Activities.....	29
Learning Sequence Activities.....	30
Traditional Taiwanese Music Curriculum.....	31
Curriculum Goals.....	32
Objectives of Music Unit for First and Second Grade Students.....	33
Purpose and Problems of the Study.....	36
Definitions.....	38

CHAPTER 2	
RELATED LITERATURE	39
Research Related to the Dalcroze Approach	40
The Crumpler Study	40
The Blesedell Study	41
The Rose Study	42
The Berger Study	43
Research Related to the Orff Approach	45
The Olson Study	45
The Siemens Study	45
Research Related to the Kodály Approach	46
The McDaniel Study	47
The Palmer Study	47
Summery of Research in Dalcroze, Orff, and Kodály	49
Research Related to the Music Learning Theory	50
The Palmer Study	50
The Stockton Study	50
The MacKnight Study	52
The Shuler Study	54
The Morgan Study	56
Summary of Research in Gordon's Music Learning Theory	59
The Effect of Instruction on Developmental Music Aptitudes	59
The Gordon Study	60
The Flohr Study	61
The Jordon-DeCarbo Study	62
The Apfelstadt Study	63
The DiBlassio Study	65
The Kane Study	66
The Taggart Study	67
Summary of Research in Developmental Music Aptitudes	69
The Use of Music Aptitude Test in Other Cultures	70
The Schoenoff Study	70
The Sell Study	71
The Jung Study	72
The Chuang Study	72
Summary	73
CHAPTER 3	
METHODOLOGY	76
Sample	76
Selection of the Population	77
Selection of the Teacher	78
Design	78
The Treatment for the Experiment Group	79
The Treatment for the Control Group	83

Instruments Used for Measurement: PMMA and Rating Scale.....	84
Procedures.....	86
Data Analysis.....	89
 CHAPTER 4	
RESULTS AND INTERPRETATIONS.....	92
Reliabilities of Tonal and Rhythm Subtests of PMMA.....	92
Reliabilities of the Rating Scales for Singing Performance.....	93
The Analysis of Tonal Aptitude Scores.....	95
Means and Standard Deviations of the Tonal Pretest.....	95
Means and Standard Deviations of the Tonal Posttest.....	96
Repeated Measure of Multivariate Analysis of Tonal Aptitude Gains Scores.....	97
Interpretation of Tonal Aptitude Gains Scores.....	98
The Analysis of Rhythm Aptitude Scores.....	99
Means and Standard Deviations of the Rhythm Pretest.....	99
Means and Standard Deviations of the Rhythm Posttest.....	100
Repeated Measure of Multivariate Analysis of Rhythm Aptitude Gains Scores.....	101
Interpretation of Rhythm Aptitude Gains Scores.....	102
The Analysis of Singing Performances Scores.....	105
Means and Standard Deviations for Singing Performance.....	105
T-test of Singing Performance Ratings.....	106
Interpretation of Singing Performance Test.....	107
The Comparison of PMMA Scores between Taiwanese and American First Grade Students.....	110
Means and Standard Deviations for Taiwanese Students and American Students.....	110
Interpretation of the Comparison between Taiwanese and American Students.....	111
 CHAPTER 5	
SUMMARY, CONCLUSION, AND RECOMMENDATIONS.....	115
Summary of the Study.....	115
Purpose and Problems.....	115
Procedures.....	116
Analysis.....	117
Results and Conclusion.....	118
Implication for Music Education.....	120
Recommendations for Future Research.....	123

APPENDICES

A: The Outline of Instruction for the Experimental Group.....	126
B: The Outline of Instruction for the Control Group.....	129
C: Repertoire List.....	131
D: Singing Performance Rating Scale.....	132
E: Answer Sheet of <i>Primary Measures of Music Audiation</i>	133
F: <i>Happy New Year</i>	134
G: UCRIHS Permission.....	135
H: Letter To the Principal of Pin-Ho Elementary School.....	136
I: Letter to Parents of Students	139
J: Consent Form for Participation in the Study.....	142
K: Consent Form for Classroom Teachers in the Study.....	143
REFERENCES.....	144

LIST OF TABLES

Table 1: Split-Halves Reliabilities of the PMMA Tonal and Rhythm Subtests.....	92
Table 2: Interjudge Reliability of the Tonal Dimension for Singing Performance.....	93
Table 3: Interjudge Reliability of the Rhythm Dimension for Singing Performance...	93
Table 4: Interjudge Reliability of the Intonation Dimension for Singing Performance.	94
Table 5: Interjudge Reliability of Composite Scores for Singing Performance.....	94
Table 6: Kendall Coefficient of Concordance Interjudge Reliabilities for Singing Performance.....	95
Table 7: Means and Standard Deviations of the Tonal Pretest.....	96
Table 8: Means and Standard Deviations of the Tonal Posttest.....	97
Table 9: Repeated Measure of Multivariate Analysis of Tonal Aptitude Gains Scores.....	97
Table 10: Means and Standard Deviations of the Rhythm Pretest.....	100
Table 11: Means and Standard Deviations of the Rhythm Posttest.....	101
Table 12: Repeated Measure of Multivariate Analysis of Rhythm Aptitude Gains Scores.....	101
Table 13: Means and Standard Deviations of Singing Performance.....	106
Table 14: T-tests Table for Tonal Accuracy, Rhythm Accuracy, Intonation Accuracy, and Composite Sores.....	107
Table 15: Means and Standard Deviations for Taiwanese and American Students.....	110

LIST OF FIGURES

Figure 1: Gordon’s Skill Learning Sequence..... 22

Figure 2: Tonality Sequence..... 88

CHAPTER 1

RESEARCH BACKGROUND

In 2001, the Taiwanese educational system for elementary and junior high schools experienced a dramatic reform, changing the structure that had been maintained since Japanese colonialism. The elementary and junior high systems adopted a nine-year mandatory educational plan based on American K-12 education models of curricular integration. In the new Taiwanese educational reform, adoption of an integrated curricular format resulted in educational disciplines being grouped into seven separate domains. Fine arts disciplines, including music, visual arts, and theatre, were integrated into a single educational discipline, named the Arts and Humanities Domain. As a result of this integration, music is no longer viewed as an independent, fine art subject of study (Ministry of Education, 2000).

Music instruction before the development of the Arts and Humanities Domain education format consisted of two forty-minute lessons per week and had an independent content and teaching sequence. With the integration of fine art disciplines into an inclusive domain, music instruction manuals were combined into a collective Arts and Humanities curriculum, and the content of music lessons was designed based on a main theme of the

integrated curriculum. Also, music classes were reduced to one forty-minute lesson per week. The purpose of this study is to explore the effect of the new Taiwanese fine arts curriculum as well as the effect of Edwin Gordon's Music Learning Theory on the music development of Taiwanese first grade students.

Music Aptitude

Both Gordon (1997a) and Suzuki (1983) believe that all children are capable of learning music if appropriate guidance and instruction are provided. Suzuki deems that the musical environment, as created by parents and teachers, is the most crucial element in a child's success in learning music. However, Gordon provides a more in-depth explanation. He suggests "how much and how well individual students learn depends on their individual levels of music aptitude" (p. 25). Music aptitude is "a measure of a child's potential to learn music" (Gordon, 1997b, p. 9). Gordon suggests that music aptitudes are a product of both nature and environment and can be affected by the environment during the first nine years of life.

As with general intelligence, every child is born with a certain level of music aptitude. Yet, environmental influences affect one's level of music aptitude until one is approximately nine years old. Before age nine, music aptitudes are developmental and fluctuate as a result of one's environment. Music aptitude during this period of time is

called “developmental,” because it can either “increase, decrease, or remain the same but will never be higher than that with which one was born” (Gordon, 1997b, p. 10). After approximately age nine, the child enters into a “stabilized music aptitude” stage, because the child’s aptitude has stabilized and will remain at that level throughout his/her life. Both developmental and stabilized aptitudes primarily consist of tonal and rhythm aptitudes, but stabilized music aptitude includes a music sensitivity component as well (Gordon, 1997b).

Schleuter and DeYarman (1971) contend that there is no systematic evidence to support Gordon’s statement concerning music aptitude. However, studies conducted in recent years have supported that music instruction at an early age may have positive influences on the development of music aptitude (DiBlassio, 1984; Dittmore, 1968/1969; Dowdy, 1996; Flohr, 1981; Jarjisian, 1981; Taggart, 1997). The type of music instruction, including instructional methods and techniques, administered at an early age, may affect how those music aptitudes develop.

The Difference between “Method” and “Technique” in Music Education

Method and technique are often used synonymously. However, Gordon (1997a) suggests that method and technique must be clearly distinguished from each other. Method, as defined by Webster (1996), is “a procedure, technique, or way of doing something in accordance with a definite plan” (p. 1209). Gordon (1997a) defines “method” as a

procedure for accomplishing something. Method is used to describe the order “in which sequential objectives are introduced in a curriculum to accomplish a comprehensive objective” (p. 28). “Technique,” on the other hand, is a process of instruction that operates on a smaller scale and is also defined as a teaching aid, which “is employed to achieve one or more sequential objectives” (p. 28). Method takes on significance when the teacher becomes concerned with how a child acquires knowledge from the information transmitted in relationship to the sequence of objectives in a course of study. It is framed in questions such as why, what, and when to teach something. Technique, on the other hand, is framed in how. To best describe the interrelationship between method and technique in the music classroom, Gordon (1988) wrote that “the most important part of a music curriculum is an appropriate method and when it is supported by appropriate techniques and materials, the result is ideal music education” (p. 31).

Generally, current methods used in general music instruction can be traced to a number of individuals whose philosophy of education incorporated the nature of music, the learner, and a particular approach to instruction. Among these individuals were Johann Pestalozzi, who contributed to the ideas of sequence, repetition, and rote; Lowell Mason, who advocated the Pestalozzian principles and their importance in the education of the child; and John Dewey, who advocated the discovery method for the solving of problems

(Costanza & Russell, 1992). Methods used in general music today incorporate many principles of Pestalozzi, Mason, and Dewey, but have evolved into specific approaches as advocated by such individuals as Jaques-Dalcroze, Carl Orff, Zoltan Kodály, and Edwin Gordon.

Mark (1996) discusses the seven predominant music education methods used in the United States: Dalcroze, Orff, Kodály, Orff and Kodály combined, Suzuki Talent Education, Comprehensive Musicianship, and Gordon's Music Learning Theory. *Music Educator Journal* in 1986 devoted an entire issue to the theme "Major Approaches to Music Education." In this issue, Kodály, Gordon's Music Learning Theory, Dalcroze, Suzuki, and Orff *Schulwerk* were discussed as the foremost music methods in the United States.

Shehan (1986) called the current approach of the typical music teacher "eclectic." She believes that "there are no universally acceptable methods in music, but rather variety of adaptations as diversified as the skills and interests of the multitude of music specialists" (1986, p. 31). In her investigation of middle school general music programs, Ardrey (1999) did not find a comprehensive practice of the Kodály, Dalcroze, or Orff approaches. However, she found that the most effective teachers naturally gravitated toward the principles of these approaches. The incorporation of these methodologies combined with

an awareness of the developmental needs of students, Ardrey suggested, provides a greater effectiveness in general music programs. Runfola and Rutkowski (1992) point out that the “eclectic” ideal for some music educators has become the rationale for an activities-dominated curriculum, because only activities and techniques are extracted from many approaches. They suggest that, in an eclectic curriculum, the techniques and activities should be organized and managed to match educational objectives. In other words, techniques and activities should function within the framework of a method.

Mark (1996) indicates that the eclectic approach most commonly used in general music instruction today is a blend of Orff and Kodály. Goodlad (1967) suggests that “children should be introduced to the structure of music through a carefully planned, sequential curriculum as rigorous and well-organized as the best curriculum” (p.2). However, some published music curricula available today, both in United States and Taiwan, lack a well-grounded theory to substantiate the sequences of objectives suggested in music series books (Byrd, 1989; Chang, 1991).

The Philosophies and Methods of Major Music Approaches: Dalcroze, Orff, Kodály, and

Gordon

The traditional Taiwanese music component of the Arts and Humanities Domain used in this study represents an eclectic instructional approach, which mainly adapts the

philosophies and teaching techniques of Dalcroze, Kodály, and Orff. For example, the use of Orff tonebar instruments, hand signs and rhythm syllables of Kodály, and the fixed-Do solfège system, which are a part of Dalcroze instruction, are prevalent in Taiwanese elementary music classrooms. An overview of these approaches is necessary in order to fully understand the essence of the traditional Taiwanese music curriculum.

The Dalcroze Approach

Emile Jaques-Dalcroze (1865-1950) was born in Vienna and lived there ten years before his family moved to Geneva. While teaching in the Geneva Conservatory, Dalcroze noted that students were often unable to play music with rhythmic accuracy and free emotive style. He also identified several problems with conservatory-based music instruction. Music history, theory, and other aspects of the discipline never came together in a comprehensive way during a student's course of study. He believed that students tended to approach harmony, theory, and performance in much the same way that they approached academic disciplines—as a set of rules to memorize and symbols to manipulate. Jaques-Dalcroze saw the weakness involved in a separation of musical learning. In response, he designed a form of instruction to develop students' musicianship that not only focused on accurate performance, but also called for an internalizing of the elements of musical expression. Also, Jaques-Dalcroze interwove musical elements into

numerous successive and concurrent experiences to lead the student towards musical understanding and technical skill. Campbell (1989) writes:

Jaques-Dalcroze maintained that the body is the mediator between musical sound and its mental construct. He established an approach to music instruction that coordinated the ear, the brain, and the kinesthetic self in response to rhythm, pitch, form, and the expressive elements of music. Jacques-Dalcroze sought to awaken a feeling for natural body rhythms and to help students develop an agility and coordination that they could apply to the realization of music rhythms through movement (p. 302).

Solfège, improvisation, and eurhythmics serve as tools to establish students' musicianship and are emphasized in order to develop the inner ear, inner muscular sense, and creative expression. The main influence of the Dalcroze approach on Taiwanese music education is the use of fixed-*do* system of solfège. It is used to develop students' aural and oral skills and is the dominant syllable system in use from the elementary level through college. Improvisation focuses on the capacity for free invention; eurhythmics is intended to give students a feeling for musical rhythm expression through movement (Carder, 1990). However, lacking an appropriate Dalcroze training program in Taiwan, most general music teachers are not capable of employing the Dalcroze approach to teach improvisation and eurhythmics. Moreover, because of the insufficient classroom space and large class sizes,

movement activities such as eurhythmics are difficult to incorporate into instruction.

Crumpler (1983) examined the effects of the use of Dalcroze eurhythmics on the melodic musical growth of first grade students. The results suggested that eurhythmics had a positive effect on students' melodic discrimination. Joseph (1983) investigated the effects of eurhythmics on rhythmic movement and improvisation of kindergarten children. Findings of the study suggested that eurhythmics deserved consideration for the inclusion in early childhood curricula.

The Orff Approach

The German-born composer, Carl Orff (1895-1982), like Dalcroze, believed that rhythm was the most important element of music. The core of Orff's music philosophy centers on the idea that music, movement, and speech are inseparable (Carder, 1990). Together, they form a unity Orff referred to as *elemental music*, which refers to the starting point for musical development and the manner in which children naturally express themselves through music at various phases of development. Movement and speech are inseparable elements in Orff and are initially derived from childhood experience. The goal of the Orff approach to music education is the development of individuals who are comfortable with active music making through singing, moving, playing instruments, chanting, dramatizing, and improvising.

Orff published his five-volume music instruction manual *Music for Children* between 1950 and 1954. His approach, called *Schulwerk*, was intended to facilitate the exploration of music and develop musicianship. After years of teaching experience, Orff confirmed his belief in the inseparable nature of music and dance, and his works culminated in an instructional approach based on his theory of elemental music. The materials used in Orff-*Schulwerk* are simple, basic, and natural. The Orff method approaches music teaching with simple concepts and simple chants and songs, which he believed to be the most suitable for young children. First, children are taught to sing and create pentatonic songs and ostinato patterns. These flow naturally out of speech patterns that begin with single words and progress towards more complex activities, such as speech canons. They also flow out of movement.

As with the Dalcroze method, improvisation is an important goal of the Orff approach. The design of sequential learning experiences within the Orff approach follows: (1) exploration—the discovery of the possibilities available in both sound and movement; (2) imitation—the development of basic skills in rhythmic speech, body percussion, rhythmic movement through space, singing, and playing instruments; (3) improvisation—the extension of acquired skills to the point at which one is able to initiate new patterns and combinations, as well as contribute to group activities, and (4) creation—the combination

of all or any of acquired skills into original music forms and miniature “theater pieces” (Chosky, Ambramson, Gillespie, & Woods, 1986; Shehan, 1986; Shamrock, 1986).

Chang (1991) indicated that the traditional Taiwanese curriculum was an eclectic curriculum in which Orff instruments were often incorporated. Various Orff instruments such as xylophones and tonebars were widely adopted in general music classrooms to help students explore the sounds and perform music.

Siemens (1967) found that students who received Orff instruction had greater interest in music and a better attitude toward music than students who received traditional music instruction. In addition, they had a greater enjoyment of rhythm activities, part-singing, and listening to their teachers’ explanation. However, as with other research investigating the effects of the Orff approach, he found no clear evidence that it enhanced students’ music achievement (Olson, 1964; Lu, 1986)

The Kodály Approach

Zoltán Kodály (1882-1967), the Hungarian-born composer, ethnomusicologist, and educator, found that students entering into the most advanced Hungarian music education institution possessed music literacy skills and had no knowledge of their national musical heritage. Therefore, Kodály developed his pedagogical philosophy to encourage Hungarian students to know, enjoy and take pride in the indigenous Hungarian musical

culture as well as to develop music literacy skills.

The goals and sequential nature of Kodály's curriculum stemmed from his ideas and philosophy, but the pedagogical techniques used to attain curricular objectives were borrowed from a variety of sources. For example, the solfège system, which was derived from the tonic sol-fa system, and the hand sign system, originally developed by Sarah Glover, were adapted from the Englishman John Curwen's instructional approach (Chosky, et al., 1986; Labuta & Smith, 1997).

The Kodály method is developmental and sequential in nature. The sequences were based upon the patterns that Kodály determined to be most natural for Hungarian children to sing and that occur regularly in Hungarian folk songs. Use of the pentatonic scale, iconic notation, musical games, and staff placements with markers were based on Kodály's philosophies and knowledge of child development. Kodály adapted Emil Chevé's rhythm syllables to help children recognize and feel the basic beat and rhythm patterns aurally to recognize them visually. The labels "ta" and "ti" were assigned to quarter and eighth notes specifically to encourage rhythmic singing. As rhythm patterns are read, they are clapped and immediately assigned a syllable "ti" or "ta." Musical elements were experienced through listening and performance when they were presented in notation. Moreover, each element was thoroughly internalized in all of its most common contexts before a new

element is presented (Labuta & Smith, 1997).

In Taiwanese music education, the use of Kodály hand sign and rhythm syllables at lower grade levels is an underlying teaching technique that has been a part of music instruction for several decades. Their use with students at higher grade levels, however, has not been amply reviewed nor have specific sequencing guidelines been established within the Taiwanese curriculum (Chang, 1991).

Research investigating the effectiveness of the Kodály approach revealed no clear evidence to support its superiority (McDaniel, 1974; Palmer, 1974; Lu, 1986; Hudgens, 1987; Fridley, 1993). Hudgens (1983) investigated the Kodály approach to teaching first grade students to sing on pitch, echo (clap) rhythm patterns, and audiate tonal and rhythm patterns. She found that Kodály instruction made a difference in students' abilities to echo rhythms, match pitches, and audiate rhythm patterns but did not make a difference in their abilities to audiate tonal patterns. Lu (1986) examined the effect of Kodály-Orff instruction on first grade students' reading ability and found no differences between Kodály-Orff instruction and the traditional instruction.

Gordon's Music Learning Theory

Gordon developed his Music Learning Theory to explain the process of how humans learn music. Music Learning Theory refers to the specific sequential taxonomies of skills

and tonal and rhythm content that Gordon has formulated. Gordon details his Music Learning Theory in his text *Learning Sequence in Music: Skill, Content, and Patterns* (1997a).

Gordon (1984) believes that the purpose of music education is “to provide students with musical understanding so that they can learn to perform and respond aesthetically, and use symbolic representations of their and others’ aesthetic feelings to the extent that their music aptitude will allow” (p. 1). The central goal of Music Learning Theory is to develop aurally-based music understanding, which he calls audiation. Gordon argues that music appreciation can be modeled and guided, but not directly taught. Without understanding, all but the purely emotional aspects of appreciation are impossible, because appreciation assumes some levels of understanding.

Although individual differences play an important role in one’s levels of achievement in music, Gordon (1997a) believes that “all students follow the same process to appropriately learn music” (p. 25). Music Learning Theory, as described by Gordon (1997a), “outlines this sequence for learning music, explaining what students need to know at particular level of learning in order to precede to a more advanced level” (p. 25).

Music Learning Theory is guided by the results derived from empirical research and connections to the work of general learning theorists, such as Gagné, Pestalozzi, and Piaget

(Gordon, 1974; Gordon, 1979; Gordon, 1980a; Gordon 1980b). However, these psychologists developed their philosophies on learning theory in a general way, not specifically related to music. Gordon (1981) suggests that there are learning theories specific to disciplines. He believes that there are skill learning sequences and content learning sequences that are specific to music. Skill learning sequences are somewhat similar in all disciplines of learning, because one perceives, discriminates, generalizes, conceptualizes, creates, and memorizes when he/she is learning in most domains. However, the content to which one applies these skills is different for each discipline (p. 66). Music Learning Theory, therefore, consists of three separate categories of music learning sequence instruction. These are skill learning sequence, tonal content learning sequence, and rhythm content learning sequence. Gordon (1997a) stresses that skill learning sequence and the content learning sequences are interdependent. It is not possible to learn a music skill without engaging in some music content, and it is not possible to learn some music content without engaging in music skill. Skill learning sequence must be combined with either tonal content learning sequence or rhythm content learning sequence.

The seven tonality classifications in the tonal content learning sequence are major, harmonic minor, dorian, phrygian, lydian, mixolydian, and aeolian. Moveable *do* syllables with *la* based minor system, *re* based dorian, and so on, are associated with each tonality. A

tonality is defined by its tonal center. For example, *do* is the resting tone in major tonality; *la* is the resting tone in harmonic minor, and so on. Pentatonic is not found in the tonal content learning sequence because of the lack of half steps with defined tonal functions. Any of the five pitches of the pentatonic scale may be audiated as the resting tone. Tonal functions, which are also a part of the tonal content learning sequence, relate to types of tonal patterns, such as tonic, dominant, and subdominant.

According to Music Learning Theory, the essence of rhythm is movement. Rhythm content learning sequence is organized on the belief that the body responds naturally to rhythm (Jordan, 1989). To audiate rhythm, one must organize rhythm patterns either consciously or unconsciously. Gordon believes that the macrobeat is fundamental to rhythm audiation. While the macrobeat is fundamental to rhythm audiation, consistent tempo and meter cannot be established without the concurrent audiation of macrobeats and microbeats. Microbeats are the principal subdivisions of the macrobeat. Macrobeats are divisible into either two microbeats, termed as duple meter, or into three microbeats, known as triple meter. "In usual duple and triple meters, all macrobeats and microbeats are of equal length, but when macrobeats are not of equal length in a rhythm pattern, the music will then be in what is considered to be unusual meter" (Gordon, 1997a, p.167). The rhythm syllable system used in rhythm content sequence is based on beat functions. The

relations among syllable names are derived from the feeling of meter rather than time value.

One can learn the rhythm solfège system without first being familiar with music notation because it is “based upon music audiation rather than upon music notation” (Taggart, 1989, p. 64). All macrobeats are associated with the syllable *du*, regardless of meter, because macrobeats function in the same fundamental way in all meters. Microbeats are associated with different sets of syllables depending upon the meters. Rhythm functions relate to types of rhythm patterns, such as macrobeats and microbeats, divisions, elongations, rests, ties, and upbeats.

Audiation

Audiation, according to Gordon (1997a), “also takes place when one hears and understands music that is not physically presented” (p. 4). When audiating, we assimilate and comprehend in our mind music that we have just heard performed or have heard performed sometime in the past. Audiation is essential to developing a sense of tonality and a sense of meter, intelligent listening to music, music literacy, and a theoretical understanding of music. It is the ability to “think” in the language of music and is the basis for music aptitude. Gordon (1997a) explains that “audiating while you are performing music is like thinking while you are speaking, and audiating while listening to music is like thinking about what someone has said and is saying as you are listening to him or her

speaking” (p. 11).

Gordon defines eight types and six stages of audiation; not all types include the same stages. The stages are sequential, but the types are not.

Types of Audiation

Gordon (1997a) defines eight types of audiation, which are necessary for music achievement.

Type 1: Audiation takes place when one is listening to familiar and unfamiliar music.

Type 2: Notational audiation takes place when one is reading the notation of familiar or unfamiliar patterns in both familiar and unfamiliar music.

Type 3: Another type of notational audiation takes place when one is writing from dictation familiar or unfamiliar patterns in familiar or unfamiliar music.

Type 4: Audiation takes place when one recalls in his/her mind familiar patterns in familiar music and performs them vocally or on a musical instrument, conducts what the inner ear hears, or simply listens in silence.

Type 5: Another type of notation audiation takes place when one writes familiar patterns in familiar music that is organized and recalled through audiation.

Type 6: Audiation takes place when one is creating or improvising unfamiliar

music, using both familiar and unfamiliar patterns, in silence or during actual performance.

Type 7: Notational audiation also takes place as one is reading both familiar and unfamiliar tonal patterns and at the same time creating or improvising new, unfamiliar, music in silence or hearing actual performance.

Type 8: Another type of notational audiation takes place when one is writing both familiar and unfamiliar patterns and at the same time creating or improvising unfamiliar music.

Stages of Audiation.

There are six stages of audiation, which are chained so tightly that they are hierarchical. The stages of audiation are summarized as follows:

Stage 1: Gordon calls this stage momentary retention. When a person is engaged in Stage 1 of audiation, he/she is perceiving the music that is in the environment, and that music is broken into short patterns of pitches and durations.

Stage 2: In this stage the patterns that are perceived in Stage 1 of audiation are given meaning by recognizing and identifying them in terms of a tonal center and/or macrobeats.

Stage 3: The patterns perceived are organized to establish objective or subjective tonality and meter.

Stage 4: The auditor retains in audition tonal patterns and rhythm patterns that have been organized.

Stage 5: The auditor recalls tonal patterns and rhythm patterns organized and audiated in other pieces of music and compares them to what they are currently audiating.

Stage 6: The auditor anticipates and predicts tonal patterns and rhythm patterns.

Levels and Sublevels of Skill Learning Sequence

Music Learning Theory is an explanation of how one learns music, and thus it reveals information about how music might best be taught. Gordon (1981) believes that children learn music and language in a similar manner. In order to develop an adequate speaking vocabulary in language, children must first develop a listening vocabulary by hearing the whole language spoken for them and to them by language-competent parents. The aural and oral dimensions of speech first interact when children hear speech and imitate speech at an early age. Children enter school with a limited but common aural/oral vocabulary, expand it, and then learn to use that vocabulary as a readiness for learning to read and write. Long before they learn to read and write, children generalize and create with their

aural/oral vocabulary. As children continue through learning, the aural, oral, and visual dimensions constantly interact and serve as readiness for one another.

Although music does not have a specific meaning, as does language, Gordon (1997a) believes that music does have syntax similar to that of language that allows the listener to give musical meaning to what is heard. Moreover, the syntax of music is learned in the same way that that of language is learned. The difference between learning music and language is that music uses tonal patterns and rhythm patterns, whereas spoken language uses words. If children are to develop musical understanding, their musical environment should be similar to their language environment, which encourages them to engage in language learning and to continue the sequential process of learning their native language.

To illustrate the development of learning process in music, Gordon describes two main types of skill learning. The first, discrimination, is rote learning that establishes a basis for audiation and subsequent music learning. The second, inference learning, uses discrimination learning as the basis for a generalized understanding of new and unfamiliar music. Figure 1 shows the skill learning sequence.

Figure1

Gordon's Skill Learning Sequence

DISCRIMINATION LEARNING

Aural/Oral

Verbal Association

Partial Synthesis

Symbolic Association (reading, writing)

Composite Synthesis (reading, writing)

INFERENCE LEARNING

Generalization (aural/oral, verbal, symbolic)

Creativity/Improvisation (aural/oral, symbolic)

Theoretical Understanding (aural/oral, verbal, symbolic)

Discrimination and Inference Learning

In general, Gordon believes that people learn in two ways: by discrimination and by inference. Discrimination learning is rote learning and is fundamental, because it provides students with the necessary readiness for inference learning. In discrimination learning, the

teacher provides the students with all of the information that they will need to learn how to categorize the provided musical content and discriminate between the content. The more musical ideas students can discriminate among, the more inferences they will be able to make.

Inference learning involves making judgments and generalizations by drawing conclusions based on knowledge acquired in discrimination learning. It takes place when students encounter content that is unfamiliar to them. Inference learning includes content that students have not specifically learned by rote. The teacher cannot teach students what to infer but can guide them concerning how to make inferences. If a student is consistently unsuccessful at making inferences, the teacher can only return that student to a discrimination learning sequence, which reinforces his/her fundamental skills in order to facilitate making the inference at a later time.

Students engage in discrimination learning when they are conscious of being taught but do not fully understand what or why they are being taught. On the other hand, inference learning occurs when students are unconscious of what they are learning, because they are teaching themselves to learn what is unfamiliar by inferring from what is familiar (Gordon, 1997a). Gordon divides discrimination and inference learning into specific skill-learning stages as follows.

Aural/Oral

Aural/Oral learning is the first and most fundamental stage of the discrimination skill-learning sequence. At the aural/oral of discrimination learning, students first listen to and then perform individual tonal and rhythm patterns using neutral syllables. They also learn to perform a large repertoire of songs and chants in variety of tonalities and meters

Verbal Association

At the Verbal Association level of discrimination learning, the association of names with sounds follows the extensive exposure of children to musical patterns and phrases. Children are expected to associate the appropriate syllables to the musical patterns that they have heard and performed at the aural/oral level. For example, the use of movable *do* syllables with a *la* based minor is the solfège system used for teaching tonality. Gordon developed a rhythm syllable system for all duple, triple, and unusual meter patterns in music. The rhythm solfège used is based on beat function rather than on rhythm duration or on notation. In this rhythm solfège system, the macrobeat is named *du* in all meters and a different set of syllables for microbeats is used for duple meter, triple meter, and unusual meter. Also, children learn the names of the meters and tonalities and the name of the pattern functions within those meters and tonalities

Partial synthesis

The aural/oral and verbal association levels are synthesized at the partial synthesis level of discrimination learning. At this level, the teacher places familiar patterns in series to see if the student can recognize them and discriminate among them through the use of tonal or rhythm syllables, and give them meaning in the context of a tonality or a meter. Once this aural recognition has been accomplished and reinforced many times, the student is ready to move forward to the next level.

Symbolic Association

Notation is introduced to students at this level. Students are taught to read and write patterns that they have previously heard and performed by associating symbols with syllables and sounds with the notation of the patterns.

Composite Synthesis

Composite synthesis is the final level of discrimination learning. When students have had adequate experience with reading and writing individual patterns, they are ready to audiate the tonality or meter of one or more series of familiar tonal patterns or rhythm patterns in familiar or unfamiliar order as they are reading or writing the patterns. At the symbolic association level, students read and write individual patterns. However, at the composite synthesis level, they become cognizant of the tonality and the meter of those

patterns. The process continues with the accumulation of more and more rhythm and tonal patterns. Eventually the student will be able to read and write musical ideas in phrases rather than patterns.

Generalization

Generalization is the first level of inference learning. The inference levels of learning generally refer to unfamiliar stimuli that have not been specifically learned by rote at discrimination levels of learning.

Generalization consists of three sublevels: aural/oral, verbal, and symbolic; the sublevels may or may not be in any specific order. At the aural/oral sublevel the teacher performs two sets of familiar and unfamiliar tonal or rhythm patterns, using neutral syllables. The students then indicate whether the sets are the same or different. They also echo unfamiliar patterns in solo, using a neutral syllable. At the generalization-verbal level, the teacher establishes tonality or meter using a neutral syllable, and students then echo solo the teacher's patterns using tonal or rhythm syllables. The same technique is used with rhythm patterns. At the symbolic sublevel of generalization, students read or write unfamiliar patterns performed by the teacher using tonal or rhythm syllables.

Creativity/Improvisation

There are two sublevels in the Creativity/Improvisation level: aural/oral and symbolic.

At the aural/oral sublevel, the teacher establishes tonality or meter using a neutral syllable.

The student then responds by performing individually new or different tonal or rhythm patterns, as if in conversation. At the symbolic sublevel of creativity/improvisation, students perform tonal patterns from notation, using either neutral, tonal, or rhythms syllables. Then students identify the tonality or meter that they are audiating as they write new patterns in response to the patterns they are given.

Theoretical Understanding

To help students understand music intellectually, letter names, time-value names, interval names, key signature names, and measure-signature names are taught at the theoretical understanding level, which is the final level in Gordon's skill-learning sequence. This level is approached only when students have achieved previous levels.

Whole-Part-Whole

While Gagné's hierarchy of the learning process represents the backbone of Gordon's Music Learning Theory, Pestalozzi's learning theory, known as Whole-Part-Whole, represents the core of Gordon's practice in the music classroom. Pestalozzi believed that children initially should be introduced to concepts holistically. Then these concepts should be analyzed and labeled by parts, and finally synthesized, which provides children a greater understanding (Bluestine, 1995; Walters, 1987). Teachers first provide students an

overview of the whole, then focus on a specific study of the parts, eventually enhancing students' greater understanding of the whole.

The applications of Whole-Part-Whole are illustrated in *Jump Right In: The Music Curriculum*, a general music basal series (Taggart, Bolton, Reynolds, Valerio, & Gordon, 2000). The philosophy of this curriculum proposes that the most effective method for teaching music to children is encompassed in a three-stage approach. At Stage 1, music teaching begins with the ear and focuses on students' musical experiences in many tonalities, meters, styles, and timbres. Students experience music in a holistic way by listening and singing songs, listening to and performing chants, and listening to and moving to music. At Stage 2, music skills, such as tonal and rhythm solfège, and music reading, are introduced. Students study music through learning sequence activities in which students respond by themselves and in a group to patterns performed by the teacher. This stage represents the "part" in the "whole-part-whole" process. Content experienced in Stage 1 is woven together with skills learned in Stage 2 to provide understanding and comprehension of music in Stage 3. Students experience music in a holistic way again in Stage 3 as they did in Stage 1, including music in many tonalities, meters, styles, and timbres.

Each lesson provided in *Jump Right In: The Music Curriculum* consists of two parts,

classroom activities and learning sequence activities. Learning sequence activities are used only for the first five to ten minutes of each music class period. The remainder of the time is devoted to classroom activities. These two types of activities are coordinated with one another in each lesson plan. Classroom activities represent the focus of most music instruction in Music Learning Theory. On the other hand, learning sequence activities are at its core.

Walters (1989) summarizes the whole-part-whole learning process as follows: (a) introduction: overview of the whole, (b) application: specific study of the parts through Learning Sequence Activities, (c) reinforcement: greater understanding of the whole. The materials unfolded in classroom activities include folk songs and aesthetic repertoire.

Classroom Activities

Classroom activities constitute the “whole” in Gordon's methodology and are activities that the majority of music teachers already use when they teach music.

Classroom activities provide opportunities for students to sing, chant, move, and play instruments as well as learn a repertoire of songs and chants. Teachers not only teach students to sing in tune, to chant rhythmically, and to move expressively, but also help the students to become familiar with the musical elements that constitute the music being taught. The teaching plans are organized in a sequential format based on Gordon's Music

Learning Theory and can be related in a meaningful way to learning sequence activities.

Learning Sequence Activities

“Method in the Gordon instructional program is based upon learning sequence activities” (Schuler, 1983, p. 158). Gordon (1997a) indicates that students’ mastery of skill in learning sequence activities is “a fundamental part of a process that provides them with the necessary skills they need to learn to audiate and to perform conventional literature in classroom activities with comprehension and artistry” (p. 250).

Learning sequence activities provide the opportunity to develop basic skills needed to successfully understand, appreciate, and produce music. The purpose of learning sequence activities is to help students learn specific patterns in a tonal or rhythmic context, which serve as a musical vocabulary for performance. Moreover, the ultimate goals of learning sequence activities are “listening to and performing literature with syntactical meaning in classroom activities” (Gordon, 1997a, p. 199). Students are engaged in tonal or rhythm pattern instruction during learning sequence activities. However, Gordon (1997a) explains that “it is never necessary to coordinate tonal and rhythm pattern activities with tonal patterns and rhythm patterns included in songs and chants in classroom activities” (p. 259). Tonal and rhythm learning sequence activities help students develop vocabularies and skills necessary for in-depth understanding of music.

The use of learning sequence activities helps music teachers to adapt instruction to fit the individual needs of all students. Although students learn the same skills, students with higher aptitude sing, chant, read, and write more patterns and patterns that are more difficult than the patterns that are read by other students. This prevents students with higher aptitudes from getting bored and students with lower aptitudes from getting frustrated.

Research investigating the effectiveness of the Gordon approach has shown various results. Due to the interaction between the different teachers and treatments, some researchers have not found positive effects of the Gordon approach on singing performance and developmental rhythm aptitude (Shuler, 1986; Morgan 1998). Palmer (1974) found a statistically significant effect in favor of the Gordon approach, but did not consider it to be practically significant. However, others have found that instruction based on Music Learning Theory had statistically significant positive effects on music aptitudes, instrumental achievement, meter discrimination, and rhythm reading (Taggart, 1997; Kluth, 1986; Stockton, 1983; McDonald, 1987).

Traditional Taiwanese Curriculum

In the new Taiwanese curriculum introduced in 2002, music instruction is incorporated into the discipline called Arts and Humanities Domain, which consists of music, visual arts, and theatre. Henceforth, music is no longer an independent subject. The

emphasis of the Arts and Humanities Domain is to enhance student understanding of arts through an integrated curricula design. “Exploration & Creativity,” “Aesthetics & Understanding,” and “Cultures & Comprehension” are the main categories of this domain. The main goal of the music portion of the curriculum is to facilitate students’ understanding of music by preserving the integrity of music learning and by integrating music with other forms of arts and cultures (Ministry of Education, 2000).

Curricular Goals

The long-term curricular goals indicated in the Arts and Humanities Domain were developed based upon three main categories, Exploration & Creativity, Aesthetics & Understanding, and Cultures & Comprehension. The details of the categories are outlined below:

- (1) Exploration and Creativity: The students explore by themselves, perceive relationships between the environment and themselves, and create arts that enrich life and the mind.
- (2) Aesthetics and Understanding: The students understand the value of the arts and appreciate artistic works through an aesthetic perspective.
- (3) Cultures and Comprehension: The students understand the culture and the style of the arts, participate in the making of arts, and take a broad view of arts.

Objectives of Music Unit for First and Second Grade Students

There are four sections of short-term objectives designed for first grade throughout ninth grade. Only the first section, specifically designed for first grade and second grade, is introduced in this study.

(1) Exploration and Creativity

1-1 To experience a variety of timbres through vocal, body percussion, instrumental, and environmental sounds.

1-2 To create music with voices, body movement, and rhythm instruments.

1-3 To express individual feelings regarding music with language, body movement, and imitation.

(2) Aesthetics and Understanding

2-1 To experience the sounds of nature and the environment and to describe individual feelings.

2-2 To cultivate appreciation for music by singing and listening.

(3) Cultures and Comprehension

3-1 To observe the environment, participate in artistic activities, and understand the role that music plays in life.

3-2 To experience and appreciate folk music from different cultures.

The term “traditional Taiwanese curriculum” refers to the type of music instruction that generally takes place in an elementary general music classroom setting in Taiwan. It is an eclectic and activities-oriented approach in which most music teachers extract only activities from predominant methodologies such as Dalcroze, Orff, and Kodály. This instruction is mainly based on the curricular manuals developed by the ministry of education. The most widely used activities in Taiwanese general music classes are music reading, beating time, and group singing (Chang, 1991). Although movement is included in the music goals, it is not incorporated in the instructional manuals in a systematic way. The outcome of this music instruction is typically not performance oriented. The size of a typical music class is approximately 36 to 40 students. Students receive music instruction once per week in 40-minute class periods from their classroom teacher.

With the guideline of Arts and Humanities Domain, the content of music lessons was developed based upon the theme of the integrated curriculum. For example, all the songs compiled in the teachers’ manual used in this study were based on and chosen for the meaning of the text as it relates to the main theme rather than children’s musical developmental needs. Also, the manual does not provide suggestions or practical activities for teachers to achieve the goals and objectives regarding kinesthetic development that were indicated in national standards for the music unit. In order to achieve those

educational goals, music teachers have to collect or develop activities by themselves. As a result, the difficulty level of activities that teachers adopt might not be appropriate to meet the individual needs of the students in the classroom. Students with high music aptitudes might easily feel bored in an activity; however, those with low aptitudes might struggle to fulfill the objectives.

The importance of method in effective music instruction has been widely recognized by music educators (Mark, 1995; Siemens, 1969; Shuler, 1986). A music method that consists of a sound fundamental theory, sequential approaches, and effective teaching techniques embodies the opportunities for developing one's music potential. Currently, Music Learning Theory is not implemented in whole or in parts within the Taiwanese fine arts curriculum. However, as a method, Music Learning Theory shows promise according to the results of several researchers (MacKnight, 1975; Stockton, 1983; Kluth, 1986; McDonald, 1991). Information generated by the research that focuses on the use of Music Learning Theory with Taiwanese students could provide Taiwanese music educators with a more effective method and, as a result, a means of improving music instruction in Taiwan.

Purpose and Problems of the Study

The primary purpose of this study was to investigate the relative effects of the traditional music instruction and a Music Learning Theory-based instruction on the development of music aptitudes and singing achievement of first grade Taiwanese students.

The specific problems of the study are the following:

- (1) To determine whether Taiwanese first grade students who receive Music Learning Theory-based instruction will have different developmental tonal aptitude scores on PMMA than students who receive instruction based on the traditional Taiwanese curriculum.
- (2) To determine whether Taiwanese first grade students who receive Music Learning Theory-based instruction will have different developmental rhythm aptitude scores on PMMA than students who receive instruction based on the traditional Taiwanese curriculum.
- (3) To determine whether Taiwanese first grade students who receive Music Learning Theory-based instruction will demonstrate different levels of singing achievement than students who receive instruction based on the traditional Taiwanese curriculum.
- (4) To compare Taiwanese first grade students' scores on PMMA to those of

standardization norms as reported in the PMMA Manual.

Definitions

Audiation: Hearing and comprehending in one's mind music that is not physically present.

Music aptitude: the potential to achieve in music.

Developmental music aptitude: music aptitude that is affected by the environment, as measured by PMMA. A child is in the developmental music aptitude stage until he/she is approximately nine years old.

Singing achievement: Accomplishment in singing performance, measured in terms of tonal accuracy, rhythm accuracy and intonation accuracy.

Traditional Taiwanese Music Curriculum: A music unit that is included in the Arts and Humanities Domain with arts and theatre. The development of the content was based on the theme of the integrated curriculum. Teaching strategies are eclectic, adapting primarily from the philosophies and teaching techniques of Dalcroze, Orff, and Kodály.

CHAPTER 2

RELATED LITERATURE

This study compares the effect of two music education curricula on the developmental music aptitudes and singing achievement of Taiwanese first grade elementary students.

The traditional Taiwanese curriculum used in this study represents an eclectic instructional approach, which mainly adapts the philosophies and teaching techniques from Dalcroze, Kodály, and Orff. Familiarity with the teaching philosophies and methods of these instructional approaches is necessary to fully understand the essence of the traditional Taiwanese music curriculum. Reviewing the related literature regarding the effect of these methodologies, as well as Gordon's methodology, serves as a preliminary orientation to introduce the effect of components of the traditional Taiwanese curriculum on aspects of student learning. Also, this study focuses on the effect of music instruction on developmental music aptitude. As a result, this chapter includes a review of the literature on the effect of instruction on developmental music aptitude. Finally, this study compares the PMMA scores of Taiwanese first grade students to those of American standardization norms, as reported in PMMA Manual. Therefore, this review includes literature directly related to the use of music aptitude tests in different countries.

Research Related to the Dalcroze Approach

The Crumpler Study

Crumpler (1983) examined the effects of the use of Dalcroze eurhythmics on the melodic musical growth of first grade students. During six weeks of treatment, 76 first grade students in four intact classes were randomly assigned to two groups. The control groups were taught using the melodic units from the *Silver Burdett Music* (SBM). The other classes represented the experimental groups, which were taught using a combination of SBM and Dalcroze eurhythmics.

An investigator-designed measurement served as pretest and posttest to measure the students' ability to identify the melodic direction of a two- to five-note series of pitches. The instrument consisted of two sub-tests. Sub-test A consisted of twenty-five items of two tones each. The students answered whether the second tone was higher than, lower than, or the same as the first tone. Sub-test B consisted of twenty-five items of five tones each. The students answered whether the tones were moving higher, lower, or higher and lower. All directions and test items were recorded on cassette tape for administration.

The pretest showed that the control group, who received only SBM instruction, had a significantly higher score than the experimental group. But, at the end of the treatment period this advantage disappeared. The change in achievement scores for the control group

was not significant, but the change in scores of the experimental group was significant.

From the results of the study, Crumpler found that eurhythmics activities had a positive influence on melodic discrimination ability of first grade students. She concluded that eurhythmics should be considered for inclusion in the study of melodic concepts.

The Blesedell study

Blesedell (1991) investigated the comparative effects of Dalcroze-based movement instruction and Laban-based movement instruction on the rhythm achievement and developmental rhythm aptitude of three- and four-year-old children. The sample consisted of 51 three- and four-year-old children from two private preschools. A pre-instructional and post-instructional rhythm aptitude score was obtained from each child. Audie (Gordon, 1989) served as the pretest and the posttest and was administered by the researcher to all children individually.

Intact classes were randomly assigned to either the Dalcroze-based movement instruction or the Laban-based movement instruction. Each class received ten 30-minute lessons. During the last instructional period, all children were asked to individually perform macrobeats and microbeats on a small hand drum to accompany the researcher singing a researcher-composed criterion song. All performances were videotaped and rated by three judges using two five-point continuous rating scales to rate each child's movement

abilities and rhythm achievement.

Two two-dimensional MANOVAS were used to analyze the data obtained. Blesedell found a main effect for both Dalcroze-based and Laban-based movement instructions. Also, when using a one-dimensional ANOVA to investigate mean differences between Audie pretest and posttest mean scores, a significant difference was found. Blesedell concluded that any type of movement instruction might be beneficial for the musical development of preschool children.

The Rose Study

Rose (1995) examined the effects of Dalcroze eurhythmics instruction on beat competency performance skills. The sample size for the study was 126 children from six intact classes of kindergarten, first-, and second-grade. The experimental group (N=65), kindergarten, first-, and second-grade students located in one school, received Dalcroze eurhythmics instruction. The control group (N=65), kindergarten, first-, and second-grade students located in the other school, received traditional music instruction.

Prior to treatment, all students were administered a pretest to measure individual beat competency performance skills. To examine preexisting differences among the subjects, Rose used a 2 (instructional group) x 2 (gender) x 3 (grade level) ANOVA to analyze students' pretest scores. The results of the pretest showed a significant difference

for the effects of instruction, gender, and grade level.

The treatment lasted for 32 weeks. At the end of the treatment, all children were individually administered the Flohr's (1991) *Rhythmic Movement Analysis Test* (RMAT), which is designed to measure beat competency performance. Posttest scores were analyzed using a 2 (instructional group) x 2 (gender) x 3 (grade level) ANOVA using pretest beat competency scores as the covariate. Rose found no significant effect of gender or grade level on beat competency performance skills. However, the Dalcroze instruction group scored significantly higher than the traditional instruction group. Rose concluded that Dalcroze instruction might result in improved beat competency performance skill among students in lower grade levels.

The Berger Study

Berger (1999) tested the efficacy of movement-based instruction for teaching two music concepts. The two music concepts examined were 1) rhythm: discrimination between duple and triple meter and aural and visual rhythm discrimination, and 2) pitch: pitch discrimination and discrimination of steps and leaps.

Three intact third grade classes and four intact fifth grade classes were pre- and posttested using Richard Colwell's *Music Achievement Test I* (1986) and the *Silver Burdett Music Competency Test*, Book 5-test 1. Two third grade classes (N=49) and two fifth grade

classes (N=49) were assigned to the pitch group. One third grade class (N=25) and two fifth grade classes (N=45) were assigned to the rhythm group. All students received instruction in rhythm and pitch concepts based on lessons from the *Silver Burdett Music* (1991) textbook. Also, the rhythm group received movement instruction based on the work of Emile Jaques-Dalcroze, and the pitch group received Dalcroze-based movement instruction related to pitch concepts. The treatment lasted for 28 weeks with two 45-minute classes per week.

Analysis of covariance was conducted with posttest scores using pretest scores as the covariate. Both groups showed significantly higher adjusted mean scores on the posttest. The third- and fifth-grade rhythm groups also had significantly higher mean scores on the meter test. Only students in fifth-grade were given the aural and visual rhythm test, and Berger found no significant difference between the two classes. In the pitch group, neither third nor fifth grade students showed statistically significant higher scores on the pitch assessment. Berger's results suggested that a combination of a systematic music instruction with Dalcroze-based movement instruction is beneficial for rhythmic development.

Research Related to the Orff Approach

The Olson Study

Olson (1964) compared the relative effects of Orff methodology and traditional methodology on melodic sensitivity. The sample size consisted of 26 sixth grade students who were assigned to one of two groups based on scores measuring musicality, melodic memory, music environment, musical attitude, school music experience, verbal and nonverbal I.Q., and socio-economic status. The two groups were as equal as possible. Each group received 18 lessons. The control group received instruction that consisted of techniques commonly used in elementary general music classrooms. The experimental group received instruction that consisted of techniques adapted from Orff *Schulwerk*. An investigator-designed measurement was used to examine students' melodic sensitivity. The results of the study indicated that both groups improved significantly on the test, but the difference in gain scores between the two groups was not significant.

The Siemens Study

Siemens (1969) investigated the effects of Orff and traditional approaches to music instruction on music achievement and attitude. Subjects, consisting of 458 fifth grade students from five schools, were randomly divided into control and experimental groups. The 225 students in the control group attended three schools in which general music was

taught using the traditional approach. The remaining 233 students in the experimental group attended two schools in which all of the students participated in the Orff-based program for at least one year.

Using a posttest-only design, the *Knuth Achievement Test in Music* (1936) and the *Kwalwasser-Ruch Test of Musical Accomplishment* (1927) were administered. Siemens indicated that students in the Orff group had significantly higher interest and attitude toward music. They also had a greater enjoyment of rhythm activities, part-singing, and listening to their teachers' lectures than students in the control group. The control group scored higher on the *Knuth achievement test* and on the *Kwalwasser-Ruch Knowledge of Musical Symbols* subtest.

Siemens suggested that further study is needed to determine whether the traditional teaching method produces more uniform knowledge of music and of association of melodies heard with those seen in notation, and whether the Orff method places uneven emphasis on the various phases of musical training.

Research Related to the Kodály Approach

Since the introduction of the Kodály method in the United State in the 1960s, increasing numbers of teachers have begun applying many of its techniques. Concurrent with the method's rise in popularity has been a growing concern as to its potential

effectiveness in the classroom. Some researchers have compared the Kodály method with another instructional approach. In all of these studies, posttest results revealed no significant differences between groups (McDaniel, 1974; Palmer, 1974; Martin, 1991; Zemke, 1973).

The McDaniel Study

McDaniel (1974) measured the difference in achievement produced by Kodály and traditional methods. The sample consisted of 269 fourth grade students from four elementary schools who were assigned to either the experimental or the control group. The experimental group received instruction based on the *Threshold to Music* series, which is based in Kodály techniques. The control group received a more traditional mix of activities based on the *Making Music Your Own* series. After 18 weeks of treatment, pretest and posttest scores on Colwell's *Music Achievement Test* (MAT) (Test 1, 2, and 3) were compared between groups. The control group had a higher mean improvement in MAT scores, but no significant differences between the groups were found for either posttest or mean change scores.

The Palmer Study

Palmer (1974) investigated the relative effectiveness of Richards' Kodály-based approach and Gordon's approach on rhythm reading abilities for fourth-grade students.

Two classes, consisting of 48 children, were taught rhythm reading based on the Richards' Kodály-based method. Two other classes, consisting of 50 children, were taught using instruction based on Gordon's approach. Both of these were experimental groups and were taught by the investigator. Another music specialist taught one class that served as the control group.

The measures in this study consisted of a written and a performance component. The three written measures were the *Meter Discrimination* subtest of MAT Test 1, *Rhythm subtest* of MAT Test 2, and the *Rhythm Concepts: Reading Recognition* subtest of ITML. The performance measures were investigator-designed, and consisted of *Response to Meter*, *Imitation of Rhythmic Patterns*, and *Response to Rhythmic Notation*.

After a five-month instructional period, the *Musical Aptitude Profile* (MAP) and the investigator-designed performance measures were administered to students as posttests. Subjects' scores for musical aptitude and rhythm reading achievement were compared.

Findings indicated that significant gains in overall rhythm reading achievement were made by the aggregated experimental classes when compared to the control classes. In other words, a systematic approach to the development of skill in rhythm reading resulted in achievement gains. This result may mainly have been attributable to the difference between the groups in teachers.

In comparing the performance achievement of the two experimental groups, Palmer found that the Gordon approach was significantly better than the Richards Kodály-based approach. Nevertheless, she concluded that the practical significance of the result was questionable. Because the actual performance achievement gain scores between the Gordon and Richards group resulted in a slight difference of 3.6 (although statistically significant), Palmer concluded that the Gordon approach might be better than the Richards approach regarding the development of rhythm reading achievement, but the result was not ensured. This speculation did not, however, receive support from statistical analysis in this study.

Summary of Research in Dalcroze, Orff, and Kodály

There is some data to support the effectiveness of the Dalcroze method with young students on rhythmic development (Crumpler, 1983; Blesedell, 1991; Rose, 1995; Berger, 1999). There is no clear research evidence to support the superiority of the Orff and Kodály methods, either when compared to other major approaches or to the traditional approaches (Olson, 1964; Siemens, 1969; McDaniel, 1974; Palmer, 1974). It is clear that other approaches to music instruction that might yield more convincing results should be investigated.

Research Related to Music Learning Theory

The Palmer Study

As stated above, Palmer (1974) investigated the effect of Gordon's approach and Richards' Kodály-based curriculum on rhythm reading ability on fourth-grade students in an elementary general music setting. She found that the Gordon approach was statistically significantly better than the Richards Kodály-based approach. However, because the actual performance achievement gain scores between the Gordon and Richards group resulted in a small difference, Palmer concluded that Gordon's approach might not be better than Richard Kodály-based curriculum in terms of supporting and developing rhythmic reading ability.

There were several problems with Palmer's study that render her conclusions questionable. The effects of different teachers for the treatments and the control group might be the cause of differences among groups.

The Stockton Study

Stockton (1983) sought to investigate the effect of rhythm learning sequence activities on the meter discrimination skills of non-music major college students and to examine the relationship between aptitude and meter discrimination achievement. The sample consisted of 52 students who enrolled in an introductory music course. The experimental group

received rote instruction derived from Gordon's learning sequence activities using rhythm syllables. They learned 12 four-measure rhythm patterns by rote without the use of notation. The control group received a lecture-demonstration approach that incorporated notation skills without performance-based activities. They also analyzed the meters of 12 recorded musical excerpts with the help of notation. Both treatments addressed aural discrimination in terms of duple, triple, and combined meter.

The Meter subtest of *Musical Aptitude Profile* was administered to all subjects as a pretest. Based on the results of this test, students were assigned to either the experimental or the control group so that the groups were equal. The treatment lasted 75 minutes per week for 12 weeks. The investigator taught both groups and devoted 25 minutes to either the experimental or the control treatment.

An investigator-designed test was administered to the students at the end of the 12-week treatment period. The test consisted of 50 recorded musical excerpts that were 25 to 30 seconds in length. The subjects were asked to identify the meter of each excerpt within the metric categories of duple, triple, or combined.

Results showed that the experimental group demonstrated significantly greater aural meter discrimination achievement than did the control group. Stockton concluded that the learning sequence activities were found to be superior to the reading and listening approach

in fostering aural discrimination. Furthermore, students having higher rhythm aptitudes demonstrated significantly higher levels of meter discrimination achievement than did those possessing lower rhythm aptitude, regardless of the instructional treatment.

The MacKnight Study

MacKnight (1975) investigated the effects of tonal pattern instruction on the aural and performance achievement of fourth grade beginning instrumental music students.

Although MacKnight did not refer to her experimental treatment as learning sequence activities, her objectives and procedures were closely similar to Gordon's work.

The sample consisted of 85 fourth grade students from three elementary schools who had signed up for beginning instrumental music. Based on their music aptitude scores, as measured by the *Music Audiation Profile* (MAP) and academic aptitude scores, as measured by the *Lorge-Thorndike Intelligence Test*, the students were divided into homogeneous experimental and control groups of no more than six students each.

Students in both treatment groups met for one 30-minute class period each week for 32 weeks. Lessons for both groups included instruction on pitches, rhythms, meters, keys, tempos, dynamics, and special musical signs. The only variation in treatment was in the method and order of the introduction of pitches. Each new pitch was taught to the experimental groups as part of a tonal pattern and each pattern was taught aurally before

presenting it in notation format. This is drawn directly from Gordon's work in which learning a vocabulary of tonal and rhythm patterns, aurally first, lays the foundation for all learning. The control group used a standard method textbook, *Breeze Easy* (Kinyon, 1959) and allowed the book to dictate the sequence and manner of presentation for new pitches. Each new pitch was introduced in notation at the top of the textbook page, along with its fingering chart.

In the presentation of rhythm, students in the experimental group learned rhythm in phrases, using a modified version of the Kodály rhythm syllable system. Again, although the syllable system used was drawn from Kodály, the approach to rhythm instruction in the context of patterns was based on Gordon's approaches, as was the focus on beat function rather than note value. Pulsations within rhythmic phrases were stressed to represent the primary beat function within each phrase. In the control group, rhythm was taught as it numerically relates to beat length. Instruction mainly focused on melodic rhythm counting, which reinforced metric pulse by using a numeric system or neutral syllables to determine the length of individual notes. "Unlike traditional instruction, the control group used rhythm syllables and were encouraged to sing assigned melodies with letter names or on a neutral syllable" (McKnight, 1975).

The achievement posttests were the *Music Achievement Test* (Test 2) and the *Watkins*

Farnum Performance Scale (WFPS), Form 2. Results showed that the experimental group scored significantly higher in both tonal and rhythm performance and in aural skills.

According to scores on the WFPS, the low aptitude students in the experimental group had a significantly higher achievement than the lower aptitude students in the control group.

For the *Music Achievement Test* (MAT), the high aptitude students in the experimental group had significantly higher music achievement than the high aptitude students in the control group.

The Shuler Study

Shuler (1986) conducted an investigation to examine the effect of Gordon's music learning sequence on music achievement. The sample consisted of 126 third grade students from six general music classes. The pretest battery included the *Intermediate Measures of Music Audiation* (Gordon, 1982) and a part of the *Music Achievement Test* (Colwell, 1967).

Two selected teachers each taught three groups for one school year. Teacher 1 taught two control groups and one experimental group; teacher 2 taught two experimental groups and one control group. Students in the experimental group participated in learning sequence activities during the first 25 percent of each class period and devoted the remainder of the class period to classroom activities; students in the control group devoted each class period entirely to classroom activities.

The posttest consisted of a singing performance test for which the students were asked to perform two criterion songs. One song was in minor tonality and triple meter and the other song was in major tonality and duple meter. The students' performances of each of these songs were audio taped, then rated by three judges using investigator-designed tonal and rhythm rating scales that consisted of five criteria each.

Results of the study indicated that the over-all means of the experimental groups were larger than those of the control groups, but there was a significant interaction between treatment and teacher variables. For Teacher 1, the performance posttest mean score of the control group was higher than that of the experimental group; however, for Teacher 2, the mean of the control group was lower than that of the experimental group. Also, both Teacher 2 groups had higher mean performance scores than either of the Teacher 1 groups.

Shuler concluded that "the effects of learning sequence activities on performance achievement appeared to vary, depending upon the teacher" (p. 131). Because of the presence of the interaction between the treatment and teacher variables, he did not draw any conclusions regarding the effects of learning sequence activities on music performance achievement.

Learning sequence activities constituted a small portion of the instructional time in Shuler's study, as would be typical in a learning theory curriculum. Classroom activities

constituted most of the instructional time. Shuler concluded that the different teaching styles of the two teachers may have had a stronger effect on the success of classroom activities than the effect of the presence or absence of pattern instruction, thus obscuring the effect of pattern instruction.

The Morgan Study

Similar to MacKnight (1975), who investigated the effect of Gordon's approach without referring to Gordon's terms, Morgan (1995) used new terms to label her treatments, which actually were drawn from Music Learning Theory. The primary purpose of Morgan's study was to test the effectiveness of a cognitive versus a behaviorist approach to rhythm instruction. She compared the effects of modes of instructional intervention on the rhythm aptitude scores of second grade students. The modes were discrimination training, which was regarded as the behaviorally-based method of instruction, and combined cognitive approaches, which were regarded as the cognitively-based method and assisted the students in the instructional process with the use of conceptual aids.

The treatment lasted for eight weeks with two 45-minute classes per week; and consisted of three specialized components, which in combination made up the five treatments. The first one was called "discrimination training," which was similar to the classical conditioning technique used in the field of educational psychology. Students who

were taught with discrimination training “received positive reinforcement to reward their discrimination of similar or dissimilar rhythmic patterns” (p.7). The second was called “cognitive intervention” approach. It was instruction based on Gordon’s skill learning hierarchy. Morgan explained that this “instruction consisted of a sequence which began at the initial level of the discrimination end of Gordon’s instructional hierarchy, the aural/oral level and then spiraled upwards to the first level of the inference level of instruction, generalization” (p. 7). Morgan called the third component “conceptual tools,” which was drawn from the verbal association of Gordon’s skill hierarchy. The conceptual tools, in this case verbal labels, were used to associate students’ aural discrimination with terms such as macrobeat and microbeat and duple and triple meter.

The sample consisted of 101 second-grade children from a small rural suburban elementary school. *Intermediate Measures of Music Audiation* (IMMA) was administered to all students as a pretest. Morgan divided students, by class, into five instructional treatment groups. Group 1 (N=19), the discrimination training group, received rhythm instruction based on discrimination training only. Group 2 (N=21), a combined cognitive intervention group, received rhythm instruction that consisted of a combination of cognitive intervention and conceptual tools. Group 3 (N= 22), a conceptual group, received rhythm instruction that consisted of discrimination training and conceptual tools. Group 4

(N=22), the sequence group, received rhythm instruction that consisted of cognitive intervention only. Group 5 (N=21) served as the control group and received general classroom music activities without specialized rhythm instruction. The first four groups received ten minutes of rhythm instruction at the beginning of each class period.

Groups 2, 4, and 5 were taught by the investigator and the other two groups were taught by another music teacher. The rhythm subtest of *Intermediate Measures of Music Audiation* (IMMA) was administered to all students and served as pretest and posttest.

According to Morgan's observation, the "combined cognitive intervention" group displayed superior rhythmic performance during the treatment compared to other groups. However, this superiority was not reflected on the IMMA posttest scores. No significant differences were found between the four experimental groups and the control group, which received no rhythmic instruction at all. Morgan concluded that:

Rhythm may be so sensitive to instruction that any exposure to rhythmic experiences, in school or out, may influence rhythmic aptitude to a point that renders formal instruction superfluous. Alternatively, rhythm may be a skill that instruction has relatively little impact on (p. 63).

Summary of Research in Gordon's Music Learning Theory

Research regarding Learning Sequence Activities and similar pattern-based instruction have provided some evidence of the effectiveness of this approach in developing music achievement among students at different age levels (Palmer, 1974; MacKnight, 1975; Stockton, 1983). However, no study has investigated the effectiveness of a combination of classroom activities and learning sequence activities of a music curriculum based on Music Learning Theory on both developmental tonal and rhythm aptitudes in the elementary general music class setting. That is a goal of this study.

The Effect of Instruction on Developmental Music Aptitudes

Moore (1990) suggests that music instruction should be directed toward developing children's aptitudes and interests. According to Moore, teaching towards the development of music aptitudes places emphasis upon the need for an enhanced music environment to enable "exploring and expanding students' potential, rather than limiting their experiences to certain exercises or activities [that] are readily achieved" (p. 25).

According to Gordon, the influence of instruction on developmental music aptitude may not be always positive, and appropriate music instruction is necessary to maintain or increase a child's music aptitude. Gordon also believes that the effect of appropriate instruction on developmental music aptitude varies according to the age of the child.

Taggart supports this view and states, “The younger the child, the stronger the influence of instruction” (Taggart, 1997).

The Gordon Study

Gordon (1979) conducted a study in which two groups from two different schools were administered *Primary Measures of Music Audiation* (PMMA). Students from the private school represented families of upper-middle and higher socio-economic status, whereas students from the community music school came from impoverished neighborhoods. The private school had two periods of Orff instruction per week with Suzuki instruction offered as an elective. Private instrumental lessons, voice instruction, music theory, and ballet constituted the curriculum of the community music school. PMMA test results of students from both schools were compared to the scores of children who participated in the standardization of PMMA. The children tested during the standardization of the PMMA represented a stratified sample of children with a normal distribution of developmental aptitude.

Results indicated that the students from the private school demonstrated a higher overall developmental music aptitude when compared to the standardized PMMA sample and the community music school students. Gordon attributed the results of the study to be a product of the rich musical environment provided at the private school, as well as to other

cultural experiences that may have been encouraged at home. Students in both the private school and the community music school had higher means than the standardization sample. Gordon concluded that the two factors, innate capacity and the quality of instruction, appeared to have an effect on the developmental music aptitude scores of children.

The Flohr Study

Flohr (1981) investigated the effect of short-term music instruction on developmental music aptitude as measured by PMMA. Twenty-nine five-year-old children were randomly assigned to one of the three groups. Group I received instruction on instrumental improvisation. Group II received instruction that included singing, playing percussion instruments, and moving. The control group received no instruction in music. After 12 weeks of treatment, PMMA was administered to all students as a posttest. Flohr found that there was a significant difference in PMMA posttest scores between the groups receiving music instruction and the control group. He concluded that short-term music instruction influences five-year-old children's developmental music aptitude. Because all children, including the control group, were given music instruction once a week during the three months preceding experimentation and music instruction in the control group stopped as soon as treatment started, Flohr also suggested that the effects of instruction on music aptitude may be temporary.

The Jordon-DeCarbo Study

Jordan-DeCarbo (1982) examined the use of same and different discrimination techniques on kindergarten students' aural perception, vocal performance of tonal patterns, and aural abilities. Subjects, consisting of 89 kindergarten students, were randomly assigned to either Experimental Group One or to Experimental Group Two. Treatment lasted for 11 weeks with three 20-minute sessions per week. Experimental Group One received tonal pattern instruction using same/different discrimination techniques. Students were asked to discriminate whether two patterns were the same or different. Experimental Group Two received the same tonal patterns as Experimental Group One, but they were instructed to respond through imitation rather than in aural discrimination.

The pretests and posttests in this study were identical and consisted of two tests, the tonal subtest of PMMA and the *Criterion Singing Test* (CST). CST was constructed by the researcher and consisted of two parts, ten three-note patterns and a criterion song. The ten patterns on the first portion of CST were selected from the PMMA tonal subtest. Eight of the ten patterns were taught during the treatment. The song included in CST was a student-chosen familiar song.

A three-way analysis of variance (ANOVA) was conducted to determine if there was a difference between the two experimental groups. As a result of treatment, Jordan-DeCarbo

found no significant differences between the PMMA tonal scores, ratings on the CST three-note patterns, and performances of the CST song. Although a significant gain was found between pre- to post-instruction on both aural perception and singing scores, “it could not be determined specifically whether the gain was due to the effect of the training or maturation” (Jordon-DeCarbo, 1982, p. 247). Jordan-DeCarbo agreed with Gordon’s (1997b) suggestion that developmental music aptitude must be enhanced at a very early age by stating that “the kindergarten age level cannot be overlooked as a critical year of development” (p. 247).

The Apfelstadt Study

Apfelstadt (1984) investigated the effect of instruction on the developmental tonal aptitude and vocal accuracy of kindergarten students. The sample consisted of three intact kindergarten classes (N=61) that were randomly assigned to one of three groups. Group One received vocal instruction that emphasized the development of melodic perception through visual and kinesthetic methods. This was accomplished by playing stair-step bells and engaging in appropriate movement activities. Group Two received vocal instruction without emphasis on perceptual and/or conceptual development. Group One and Group Two served as the experimental groups and were taught by the investigator. Group Three served as the control group and was taught by another music teacher.

Prior to the treatment, Apfelstadt distributed a questionnaire to parents in order to collect information about each student's musical background. Also, the investigator spent three-and-a-half weeks in an orientation period with the students so that they could become familiar with the investigator, possibly reducing test anxiety. During the orientation period, there was no treatment. After the orientation period, the students were pretested using the PMMA tonal subtest, the *Boardman Test of Vocal Accuracy*, and a rote-singing test.

During the treatment, the experimental group received two 30-minute class periods per week. The control group received two 20-minute class periods per week and a 30-minute recreational singing period per week. Lesson plans for the experimental group were identical, except that those used for Group One emphasized song instruction through kinesthetic, visual, and instrumental means. Lessons for Group Two emphasized song instruction without reinforcement of pitch contour or pitch direction. The control group was activity-oriented and did not include instruction on pitch or duration.

At the end of the 11-week instructional period, the students were posttested using the PMMA tonal subtest, the *Boardman Test of Vocal Accuracy*, and a rote-singing test.

Results of the study indicated that gender did not affect test performance. Also, Apfelstadt found that poor singers came from homes without quality musical environments and better singers came from homes with quality musical environment. There was no significant

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difference between the tonal aptitudes of the students who had received the investigator's instruction and those who had not, as measured by the PMMA tonal subtest. However, the interaction of differences of teachers and treatments might be the cause, which affected the results of the study.

The DiBlassio Study

DiBlassio (1984) investigated the effects of four methods of tonal and four methods of rhythm pattern instruction to determine which type of instruction positively affects the development of tonal and rhythm aptitudes, respectively. Subjects consisted of sixteen first grade classes from four schools in the Wilmington, Delaware area. Classes were divided into two groups of eight. Eight of these sixteen classes were administered the PMMA tonal test received tonal pattern instruction. The remaining eight were administered the PMMA rhythm test and received rhythm pattern instruction. The treatment lasted for 12 weeks with one seven- to ten-minute class period per week.

Tonal pattern instruction was divided into the following four tonality combinations: Group I (major and minor), Group II (major, minor, dorian, and mixolydian), Group III (major, minor, and atonal), and Group IV (pentatonic). Rhythm pattern instruction was divided into four metric combinations: Group I (duple and triple), Group II (duple, triple, and combined), Group III (duple, triple, unusual paired, and unpaired), and Group IV

(duple, triple, combined, unusual paired, and unpaired).

At the end of the twelve-week treatment period, all groups were posttested with either the PMMA tonal or the rhythm subtests, depending on what type of instruction they had received. Results indicated no significant interactions or significant differences among the different forms of instruction. However, a significant main effect that indicated that low aptitude students made greater gains than high aptitude students was found in both tonal and rhythm groups.

DiBlassio concluded that none of the four methods of tonal and rhythm instruction was superior to others. As would be expected as a result of regression toward the means, students with low developmental tonal and/or rhythm aptitude, however, gained more than students with higher developmental tonal or rhythm aptitude, regardless of the type of tonal and/or rhythm instruction.

The Kane Study

Kane (1994) examined the effect of teacher training on the developmental music aptitudes and music achievement of kindergarten students. Teachers were taught to present tonal preparatory audiation guidance techniques and traditional rote song training techniques to kindergarten children. The tonal preparatory audiation guidance techniques involved singing songs in various tonalities without words and echoing tonal patterns using

the neutral syllable *bum*. The traditional rote song techniques involved singing songs in major and harmonic minor tonalities with words.

Prior to the study, the vocal abilities of the kindergarten teachers were assessed and all of the children took PMMA as a pretest. At the end of the treatment, vocal abilities of both teachers were reassessed. All of the children also took PMMA as a posttest and received a singing achievement test.

The teachers consisted of one male and one female. The student sample consisted of four groups of kindergarten children. The children in the experimental group received instruction in tonal preparatory audiation guidance. The children in the control group received rote song instruction.

There was no significant difference between groups. Kindergarten teachers were equally effective in teaching either of the two techniques. However, Kane concluded that there was evidence to suggest that tonal preparatory audiation guidance had a greater effect on the developmental music aptitude and/or singing achievement of kindergarten children rather than instruction that focused on traditional rote song instruction.

The Taggart Study

Taggart (1997) investigated the developmental tonal and rhythm music aptitudes of preschool through second grade students. A music teacher administered age-appropriate

music instruction with two 20-minute classes per week for one academic year. Prior to and following instruction, *Audie* (Gordon, 1989) was administered to measure the aptitudes of preschool children, and PMMA was administered to the kindergarten, first, and second grade children. The instruction 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 designed to help students move in continuous fluid manners.

Taggart reported that aptitude scores of kindergarten, first, and second grade students at the end of instruction were significantly higher than pre-instruction scores, even after controlling for maturation. Preschool rhythm aptitude scores were also higher, but results were not significant tonally with the preschool children. Kindergarten children reported the largest gains, followed by first grade children, and followed by the second grade children.

Taggart found that aptitude scores continued to increase over the summer for all of the children who were measured. At the beginning of the next academic year, the aptitude scores of the children who received instruction the previous year were significantly higher than students who did not receive instruction. Primarily, Taggart concluded that appropriate instruction for children between the ages of three and eight significantly increases tonal and rhythm developmental aptitudes. Second, the effect of appropriate

instruction on developmental music aptitudes is dependent on the age of the child. Taggart emphasized the importance of appropriate instruction at an early age by stating, “The younger the child, the stronger the effect of instruction” (1997). Moreover, Taggart concluded that the effect of appropriate instruction on developmental music aptitude is retained over time. In conclusion, Taggart reported that the developmental music aptitudes of all students continued to increase after four months of no instruction and were not a product of maturation.

Summary of Research in Developmental Music Aptitudes

Research investigating the effects of instruction on music aptitudes, although somewhat conflicting, revealed that music aptitude scores do increase when instruction is appropriate, and that the younger the child, the more he or she will profit from appropriate instruction. The interaction between the treatment and teacher variables might be the main cause that affected the results obtained in the research that did not find significant differences between treatments (Kane, 1994; Apfelstadt, 1984). Apfelstadt (1984) and Jordan-DeCarbo (1982) were also aware that the 11-week treatments seemed not long enough to investigate young children’s music aptitudes thoroughly. Possibly if the length of the treatment lasted longer, the differences of results would have been significant.

The Use of Music Aptitude Test in Other Cultures

Primary Measures of Music Audiation (PMMA) is a standardized music aptitude test used in this study. It has been validated for the use with American children. However, studies about the use of this test in other cultures are nonexistent. Chang (1999) used *PMMA* in his dissertation but did not report the test reliabilities. In addition, the time between items was altered on his test tape, calling the validity of the translated instrument into question. Fortunately, there have been studies about the use of aptitude tests other than *PMMA* in countries outside of the United States and even in Taiwan, specifically.

The *Music Aptitude Profile* (Gordon, 1995), referred to as *MAP*, is a test battery designed to measure stabilized music aptitude for students from grades 4 through 12. *MAP* consists of three tests: *Tonal Imagery*, *Rhythm Imagery*, and *Musical Sensitivity*. Two subtests are provided within *Tonal Imagery* and within *Rhythm Imagery*. They are *Melody* and *Harmony* for the former and *Tempo* and *Meter* for the latter. The test, *Musical Sensitivity*, comprises three subtests: *Phrasing*, *Balance*, *Style*.

The Schoenoff Study

Schoenoff (1972) tested 2,021 both German musically selected and general students in grades four through twelve from three different sections of Germany using *MAP*. *MAP* directions were translated into German and recorded on the test tape, but the English

numbers on the answer sheet were not translated. Schoenoff explained the English numerals and the meaning of the answer sheet designations of “L,” “S,” and “D” for “like,” “same,” and “different” in German before the test began. The results indicated that the German students scored higher than the American students and that the majority of scores in the standard score-percentile rank comparisons favored the German students. He determined that MAP is a valid test with a German population and that German students scored higher than but practically comparable to the American students.

Schoenoff did not use statistical test to determine whether the differences between German and American students were significant. This caused ambiguity in the results of in the study. In addition, this study was conducted thirty years ago. Education in Germany may have been changed since then. The study should be replicated to investigate further use of MAP with German students.

The Sell Study

Sell (1976) investigated the use of the MAP in Finland. The sample was 5,083 students from 252 classes in 57 schools. Finnish norms were developed for each grade and for musically selected students in grade three through five, six through eight, and nine through eleven. Sell concluded that there was no significant difference in the reliability of the Finnish version and the American version of MAP. A significant difference between the

standard and raw scores between two populations showed that the published American norms were not adequate for use with the Finnish population. Finnish students scored higher than the American students. Also girls scored higher than boys in Finland, especially in the eighth and ninth grades.

The Jung Study

Jung (1992) used 94 Korean students to correlate MAP scores with the scores of the *Aural Dictation Music Achievement Test* (ADMAT), which was developed by the investigator. Also, she used Korean traditional music achievement scores for instrumental performance, as measured by the students' teachers, to determine the validity of MAP with Korean students. The correlations between MAP scores and ADMAT scores ranged from .33 to .66. The correlations found between the MAP and Korean traditional music performance scores ranged from -.01 to .28. Jung concluded that MAP measures music aptitude among Korean students for Western music but not for Korean traditional music.

The Chuang Study

Chuang (1997) investigated the use of *Musical Aptitude Profile* (MAP) with 1,723 Taiwanese students from fourth grade to twelfth grade in central Taiwan. Two of the three subtests of MAP, Tonal Imagery and Rhythm Imagery, were used to measure students' tonal and rhythmic aptitudes. Three questionnaires were administered to selected students

(N=1,066), parents, and music teachers. Results showed that the subtests of MAP were valid music aptitude measurements with high reliabilities and concurrent validities for Taiwanese students. However, Taiwanese students scored significantly higher than American students as reported in MAP Manual.

Summary

The research reviewed focuses on three major areas: (a) the effects of instruction using major approaches to music education, (b) the effects of instruction on developmental music aptitude, and (c) the use of music aptitude tests in other cultures. Research that is closely related to the above areas was presented to provide a foundation and served as the primary impetus for the present study.

Previous research lead one to believe that (a) there is no or little clear research evidence to support the superiority of any specific pedagogical approach; (b) music aptitude may develop as a result of appropriate instruction; and (c) the *Music Aptitude Profile* is a valid music aptitude test for students from other countries.

Studies concerning learning sequence activities have provided some evidence of the effectiveness of Gordon's approach toward facilitating music aptitude and achievement among students at a variety of age levels. However, a study specifically investigating the

effect of Music Learning Theory-based instruction in Taiwanese elementary schools
general music class setting is non-existent.

The studies relating to music aptitude indicated that the likelihood for bias is possible when the investigator was the teacher (Palmer, 1974; Stockton, 1983; McDonald, 1991; Morgan, 1998). Therefore, this study used a designated music teacher who is a qualified music specialist both in the Taiwanese traditional music curriculum and Gordon's Music Learning Theory. Also, the differences in teachers might affect the results of the treatment (Palmer, 1974; MacKnight, 1975; Shuler, 1986; Morgan, 1998). In order to collect more precise data derived from the treatment, this study used one teacher throughout for control. Most of the preceding researchers attempted to validate and investigate Gordon's Music Learning Theory without using a published version of Gordon's curriculum (Palmer, 1974; MacKnight, 1975; McDonald, 1991; Morgan, 1998). The investigators designed specific curricula for use in their research; as a result, the researchers' decisions were based on subjective authenticity of the application of Gordon's Music Learning Theory. Therefore, the Music Learning Theory-based instruction used in the present study was based on *Jump Right In: The Music Curriculum and Teachers Guide Book 1* (Taggart, Bolton, Reynolds, Valerio, & Gordon, 2000). With this curriculum, the teacher was provided with an authoritative Music Learning Theory source to assist in the authentic implementation of

Gordon's Music Learning Theory in the Taiwanese general music classroom setting.

Stockton (1983) concluded that Gordon's approach has a positive effect on rhythm instruction; however, subjects in his study consisted of college age students. Results generated from the study focused on the subjects of different age levels might be necessary to confirm Stockton's findings.

Thus, the present study seeks to provide information that might connect to previous studies on implementing Gordon's Music Learning Theory. By investigating the effect of instruction using the traditional Taiwanese music curriculum and Music Learning Theory-based instruction on singing achievement and developmental music aptitudes, this researcher attempts to fill gaps existing in the research. He also hopes to provide information regarding the overall validity of PMMA as a measurement of developmental music aptitudes for Taiwanese first grade students.

CHAPTER 3

METHODOLOGY

The problems of this study are (a) to investigate the effect of the traditional Taiwanese curriculum and a Music Learning Theory-based curriculum on the developmental tonal aptitudes of Taiwanese first grade students, (b) to investigate the effect of the traditional Taiwanese curriculum and a Music Learning Theory-based curriculum on the developmental rhythm aptitudes of Taiwanese first grade students, (c) to investigate the effect of these types of music instruction on Taiwanese first grade singing performances, and (d) to compare Taiwanese first grade PMMA scores with standardization norms, as reported in the PMMA Manual. The sample, research design, research measurements, and data analysis methods are discussed in detail in this chapter.

Sample

The sample for this study began with 144 first grade students from an elementary school in Changhua City, Taiwan. As a result of absences during either treatment or tests, three students were excluded from the study. Therefore, the sample size for data analysis totaled 141 students. First grade students in this study received music instruction once a week for 40 minutes each class period. Students ranged from ages six to seven and were

representative of urban families from middle to higher socio-economic status. Prior to the study, most of the subjects attended kindergarten and received some informal music lessons there. Therefore, the music instruction given in the study was their first formal music instruction in elementary school.

Selection of the Population

The first-grade students were chosen for three reasons. First, first grade is the first year in which Taiwanese children receive formal music instruction. Thus, the investigation of the effects of music instruction at the first grade level could provide suggestions for further music curricular development and music instruction in the upcoming elementary years.

Second, the year in which the study occurred was the first practical administration of the newest curricular reform in Taiwan. The inquiry on the effectiveness of the music unit in the Arts and Humanities Domain with students who had no previous formal music instruction might provide suggestions for the subsequent curricular editions.

Finally, the age level of the selected sample represents a critical stage in music development. According to Gordon, the developmental music aptitudes at this stage may be positively or adversely affected by the type of instruction received. Given the importance of music instruction at this level, research concerning effective teaching

approaches with students of this age is extremely important. Therefore, the results of this study might provide useful information concerning music instruction and curriculum that enhance musical development of Taiwanese first grade students.

Selection of the Teacher

The designated teacher in this study had a total of five years of full-time general music teaching experience. Her teaching experience also included a number of years conducting elementary school concert bands and choirs in Taiwan, as well as one year of teaching early childhood music at the Community Music School located in Michigan State University. She had additional training and experience in the traditional Taiwanese curriculum, which mainly consists of Orff, Dalcroze, and Kodály methodologies. Her background in Gordon's Music Learning Theory includes the Level 1 certification issued by Gordon Institute for Music Learning (GIML), classes and seminars taught by Edwin Gordon and Cynthia Taggart, and extensive study of Gordon's philosophies and his book *Learning Sequence in Music* (1997a). Music Learning Theory served as the foundation of her instruction for private piano lessons and general music classes for two years prior to this investigation.

Design

Four intact first grade classes from Pin-Ho Elementary School were randomly selected for this study. Two classes were randomly assigned to the control group and the

other two to the experimental group. The experimental group received instruction based on a Music-Learning-Theory, which consisted of activities and techniques suggested in the text *Jump Right In: The Music Curriculum*, a basal series designed for use in American elementary general music classroom (Taggart, Bolton, Reynolds, Valerio & Gordon, 2000). Also, they received learning sequence activities during the first ten minutes of each class period and classroom activities during the remainder of the class period. The control group received music instruction primarily based on the traditional Taiwanese curriculum and drawn from the music instruction components of the teachers' manual developed by the Taiwanese Ministry of Education. Class periods for the control group were entirely devoted to classroom activities.

Both groups received one 40-minute music class per week for 12 weeks. All four classes were taught by a designated music teacher. During the 12-week instructional period, the classroom teachers of each class allowed the investigator to make up any music lessons that were missed due to assemblies or holidays. All four classes received the same amount of instruction throughout the 12 weeks.

The Treatment for the Experimental Group

Music instruction for the experimental group was based on Gordon's Music Learning Theory, which included two parts: learning sequence activities and classroom activities. A

representative lesson plan can be seen in Appendix A. During learning sequence activities, new skills such as solfège and music reading were introduced through pattern instruction. Students first listened to and sang or chanted both tonal and rhythm patterns using neutral syllables without seeing the notation of these patterns. Appropriate syllables and notations then were associated with patterns that had been learned aurally, kinesthetically and orally. Patterns were individualized according to each student's scores obtained on the PMMA pretest. Tonal patterns in major and minor tonalities and rhythm patterns in duple and triple meters were taught separately. During the 12 weeks of treatment, students engaged in tonal pattern instruction and rhythm pattern instruction every two weeks, respectively.

The *Jump Right In* curriculum includes two Tonal Register Books and two Rhythm Register Books (Gordon & Woods, 1990). These consist of 42 units, and each unit provides three patterns with different difficulty levels, easy, middle, and difficult. Because of the time frame of the study, Tonal Register Book 1 and Rhythm Register Book 1 were used for pattern instruction.

When administering learning sequence activities, the teacher first established the tonalities or meters for students using a tonality sequence or meter sequence. During instruction, the teacher used facial expression and hand signals to ask individual students or the entire class to listen to and then to respond the patterns.

Each student's scores on the PMMA pretest were converted to percentile ranks. Then, students were assigned to one of three groups, low, middle, and high, within the classroom according to their percentile ranks. A student who scored from the 80th to the 99th percentile was considered "high," and would be asked to respond to easy, middle, and difficult patterns. A student who scored from the 21st percentile to the 79th percentile was considered "middle," and would be asked to respond to easy and middle patterns. A child who scored from the 1st percentile to the 20th percentile was considered "low," and would be asked to respond to only easy patterns. Students in the same group were arranged to sit together in order to help the teacher to keep tracking when administering individual pattern instruction. The children in the high group were placed in the middle with the low group on one side and the middle group on the other as suggested by Gordon (1986).

The tonal syllables used for the experimental group was movable-*do* system with a *la*-based minor. Regardless of keyality, *do* is the resting tone in major tonality; *la* is the resting tone in harmonic minor or aeolian tonality, and so on. The rhythm syllable system was based on beat function rather than on rhythm duration or on notation. The macrobeat is named *du* in all meters and a different set of syllables for microbeats is used for duple meter, triple meter, and unusual meter.

Classroom activities, as suggested in *Jump Right In*, consisted of listening to,

performing, and moving to songs in major and minor tonalities, as well as meters ranging from duple and triple to unusual meters. Movement activities such as continuous fluid movement, walking to the beat, and simple circle dances, were also incorporated into each class period. Songs were taught using beanbags, rhythm sticks, and various Orff instruments. The teacher sang each song in its entirety many times before the students were asked to sing the song by rote. In learning to play the song on the Orff instruments, each tonal and rhythm pattern was isolated and initially sung or chanted. Appropriate syllables were then associated with the tonal and rhythm patterns. The notation representing the pattern was introduced after extensive aural and verbal association experience, and after learning several songs. Singing or listening to songs began with a proper tonality sequence and included reinforcement of the resting tone as well as tonal pattern instruction. Students in the experimental group were often asked to sing the resting tone at the end of songs during the 12-week instructional period. In addition to nine songs included in the singing repertoire (see Appendix C), which was the same repertoire used with the control group, students were exposed to songs in various tonalities and meters without being asked to sing them during the classroom activities.

The Treatment for the Control Group

The control group received instruction as indicated by the traditional Taiwanese curriculum. A representative lesson plan can be seen in Appendix B. Students chanted the syllable "*ta*" to represent the quarter note and "*ti-ti*" to represent two eighth notes. Also, students were often asked to read and clap the rhythm patterns or pitches shown on the flash cards included as a part of the Taiwanese curriculum. The meter of the rhythm patterns that were taught in the control group were all in duple meter. Tonal music reading was first introduced using the individual note g^1 . Additional notes were introduced using solfège and hand sign activities and culminated into a range from c^1 to c^2 . Students were taught to sing the note names throughout the song using the fixed-*do* system and Kodály hand signs. After students were familiar with the melody, text was added.

In addition to nine songs included in the teacher manual, the designated teacher sang a number of pentatonic songs and Taiwanese folk songs to enhance lesson content. These songs were representative of the characteristics of the repertoire included in the national curriculum. As with the experimental group, students in the control group were exposed to these additional songs without being asked to sing. The tonalities of these songs were pentatonic or major and the meter was duple. Various tonebar instruments were used to explore the musical sounds and to perform tonic and dominant ostinato while singing.

Instruments used for Measurement: PMMA test and Rating Scales

Instruments used for measurement consisted of the tonal and rhythm subtests of the *Primary Measures of Music Audiation* (PMMA) and a rating scale developed by the researcher to rate individual singing performances (see Appendix D). PMMA was administered to the students in both groups as a pretest and posttest measure. A singing performance rating scale was used at the end of the 12-week instructional period to rate criterion song performances of the students. All singing performances were tape-recorded. Three independent judges rated students' singing performances on the dimensions of tonal accuracy, rhythm accuracy, and intonation accuracy. The results of the dimensions were combined to form a composite score.

The *Primary Measures of Music Audiation* (PMMA) was designed by Gordon (1986) to measure the developmental music aptitudes of students from kindergarten through third grade. The purpose of this test is to help teachers adapt instruction according to specific individual needs of their students. Also, it provides additional information for parents to use in seeking appropriate informal and/or formal music learning opportunities outside of the general music classroom (Gordon, 1986).

PMMA consists of two subtests: a tonal subtest and a rhythm subtest. Each subtest contains 40 items and is recorded on separate cassettes with practice examples. Each of the

two subtests lasts approximately 12 minutes. Reading skills are not required to take the test, because every test item on the answer sheet is identified by a picture of a familiar item rather than by a number (see Appendix E). The test items were performed using a synthesizer. Students were asked to indicate whether two short original musical phrases were the same or different. Students answered by circling the appropriate set of faces on the answer sheet that were the same if they thought that the patterns were the same. If the patterns were different, the students were asked to circle the faces that were different.

Woodruff (1984) investigated the validity of PMMA with kindergarten children. Results indicated that the PMMA tonal subtest had a high diagnostic validity; the rhythm subtest had a moderate degree of diagnostic validity. The composite score was found to have a high predicative validity.

At the end of the 12-week instructional period, in addition to the PMMA posttest, a singing performance test was administered to both the control and experimental groups. A singing performance rating scale (see Appendix D) was designed by the investigator to measure the performance of the criterion song *Happy New Year* (see Appendix F). The criterion song represented one of the songs included in the traditional Taiwanese curriculum and was chosen based upon the responses of the students when taught during the treatment period.

The rating scale used to measure singing performances consisted of three dimensions, tonal accuracy, rhythm accuracy, and intonation accuracy. Each dimension consisted of five continuous criteria. Prior to the actual rating of performances, the rating scales were pilot-tested. The interjudge reliabilities were found to be .91 for tonal accuracy, .84 for rhythm accuracy, .84 for intonation accuracy, and .87 for composite scores. These values indicated a great degree of agreement among the three judges.

Procedures

After the investigator's committee accepted the proposal, a copy of the proposal was submitted to and approved by the University Committee on Research Involving Human Subjects (UCRIHS). After receiving the permission from UCRIHS (Appendix G), a formal letter (see Appendix H) was sent to ask permission from the Pin-Ho Elementary School principal, classroom teachers, and the music teacher to facilitate this study. The investigator held one meeting with the principal and class teachers and two parent conferences to explain the research design prior to the designated dates of the preliminary administration. Also, to inform the children about the study, the investigator met with each class in the presence of the classroom teachers. At the parent conferences, a letter (see Appendix I) was given to each parent, which included the purpose and problems of this study, the procedures of the study, the meaning of music aptitude, the purpose and

procedures of PMMA, and suggestions on how to interpret the results of the test. If children were to participate in the study, consent forms (see Appendix J) had to be signed by their parents and returned to the researcher. Only the children who returned the consent forms with parental signatures were allowed to participate in this study.

Before the study started, the researcher, who is a native Chinese speaker, translated the directions of PMMA into Chinese. In the study that investigated the effects of Suzuki and varied listening on Taiwanese children's developmental aptitudes, Chang (1997) translated the PMMA testing CD into Chinese language. However, with the absence of reliability and validity of the translated CD, the present study used the combination of the original CD and the translated directions.

The administration of PMMA took place at the beginning of the 2001 school year during a scheduled music class period. During the administration of PMMA, the classroom teacher, the music teacher, and the investigator were present to assist children with any difficulties in understanding the directions. The classroom teachers and the investigator made sure that all of the children were on the correct item. Students were instructed to put their finger on the object of the item to be answered. No talking or humming was allowed during the tests, as is suggested in the PMMA Manual. The tests were completed without stopping the tape once the test started.

Three weeks before the end of the treatment period, the criterion song *Happy New Year* was taught to both groups according to the school calendar. *Happy New Year* is in major tonality and duple meter. The singing performance test was administered by the designated music teacher rather than by the investigator, because the children were more familiar using the music teacher as a vocal model. This decision also was made because of previous research that indicated that children feel more comfortable matching pitch with a female model than a male model (Small & McCachern, 1983).

At the end of the 12-week period, students were lead individually by the music teacher to an adjacent room and audio-taped while singing the criterion song. Prior to audio-taping, the music teacher sang the major tonality sequence (see Figure 2) using a neutral syllable before the child sang the criterion song. The music teacher then turned on the audio-cassette player and gestured for the student to sing *Happy New Year*.

Figure 2

Tonality Sequence



Three experienced general music teachers in central Taiwan served as judges in this

study. The judges listened to and rated all of the students' recorded performances using an investigator-designed rating scale. The judges did not teach any of the students participating in the study and were not provided with information that revealed the identity of the students or the treatment received.

Data analysis

The PMMA pretest and posttest answer sheets were corrected, and raw scores were converted to the standard scores using the tables provided in the PMMA Manual. Split-halves reliabilities and standard deviations for both of the PMMA subtests and singing performance test were computed using the raw scores.

Means and standard deviations were computed for the PMMA raw scores of both the tonal and the rhythm subtests and for the singing performance scores. The inter-judge reliabilities of the singing performance rating scales were also calculated using the Pearson Product-Moment correlation and the Kendall Coefficient of Concordance formula.

In order to answer the problems in this study, data analysis was accomplished using comparative means analysis. Statistical differences in means were determined using a two-tailed T-test for significance at .05 level. In addition, repeated multivariate analysis was used to (1) adjust the final exam mean scores on the basis of the pretest means and (2) to compare the adjusted final exam means to determine if they were significantly different

from one another. Following is a detail of the analytical techniques used.

1. Repeated measures of multivariate analysis were conducted to determine whether Taiwanese first grade students who received Music Learning Theory-based instruction had different developmental tonal aptitude scores on PMMA than students who received instruction based on the traditional Taiwanese curriculum.
2. Repeated measures of multivariate analysis were also conducted to determine whether Taiwanese first grade students who received Music Learning Theory-based instruction had different developmental rhythm aptitude scores on PMMA than students who received instruction based on the traditional Taiwanese curriculum.
3. Two-tailed T-tests were conducted for each of the three dimensions and composite scores to determine whether Taiwanese first grade students who received Music Learning Theory-based instruction demonstrated different levels of singing achievement than students who received instruction based on the traditional Taiwanese curriculum.
4. In order to determine whether PMMA is a valid measure for Taiwanese first grade students, two-tailed T-tests were used to compare the PMMA pretest

scores of Taiwanese first grade students to those of standardized norms, as reported in the PMMA Manual.

CHAPTER 4

RESULTS AND INTERPRETATIONS

Reliabilities of Tonal and Rhythm Subtests of PMMA

Split-halves reliabilities were computed and reported in Table 1 for both the tonal subtest and the rhythm subtest of PMMA, which served both as pre- and posttest in this study. The split-halves reliability coefficients were similar to the ones reported in the PMMA Manual (see Table 1), indicating that PMMA is a reliable battery for Taiwanese first grade students.

Table 1

Split-Halves Reliabilities of the PMMA Tonal and Rhythm Subtests

		Tonal Reliability	Rhythm Reliability	Composite Reliability
PMMA Manual		.89	.85	.92
Taiwanese	Pretest	.90	.84	.93
	Posttest	.91	.88	.91

Reliabilities of the Rating Scales for Singing Performance

At the end of the 12-week instructional period, three independent judges rated the student performances of the criterion song. The interjudge reliabilities obtained were Pearson Product-Moment correlation coefficients between each student's composite ratings for each pair of judges. The results of this analysis for each dimension and composite scores are found in Table 2, Table 3, Table 4, and Table 5.

Table 2

Interjudge Reliability of Tonal Dimension for Singing Performance

	Judge 1	Judge 2	Judge 3
Judge 1		.82	.90
Judge 2			.87
Judge 3			

Table 3

Interjudge Reliability of Rhythm Dimension for Singing Performance

	Judge 1	Judge 2	Judge 3
Judge 1		.90	.90
Judge 2			.91
Judge 3			

Table 4

Interjudge Reliability of Intonation Dimension for Singing Performance

	Judge 1	Judge 2	Judge 3
Judge 1		.89	.91
Judge 2			.88
Judge 3			

Table 5

Interjudge Reliability of Composite Scores for Singing Performance

	Judge 1	Judge 2	Judge 3
Judge 1		.88	.91
Judge 2			.85
Judge 3			

The interjudge reliability coefficients of each dimension ranged from .85 to .91.

These values indicate that each of the judges was consistent with the other two judges in his/her over-all ratings. There was a high level of agreement among the three judges regarding the student singing performances.

Kendall Coefficient of Concordance also was calculated to investigate the interjudge reliability of all three judges together focusing on the dimensions of tonal accuracy, rhythm accuracy, intonation accuracy, and composite scores (Siegel, 1956; Howell, 1997). Results of the reliability coefficients are shown in Table 6.

Table 6

Kendall Coefficient of Concordance Interjudge Reliabilities on Singing Performance

	N	W	chi-square	DF	Sig.
Tonal Accuracy	141	.114	31.802	2	.000
Rhythm Accuracy	141	.079	24.332	2	.011
Intonation Accuracy	141	.036	10.125	2	.006
Composite Scores	141	.037	10393	2	.006

 $(p \leq .05)$

The Kendall coefficient of concordance for the subtests and composite scores reached significance, which also suggests that the three judges were consistent in their measurements of specific dimensions of student singing performance.

The Analysis of Tonal Aptitude ScoresMeans and Standard Deviations of the of the Tonal Pretest

At the beginning of the study, four intact Taiwanese first grade classes were randomly divided into two groups. They served as the control group (n=69) and the experimental group (n=72). The two groups were examined for evidence of preexisting differences on developmental tonal aptitude. The means of tonal pretest scores show a slight advantage for the control group. However, the result of two tailed T-test conducted on the means indicated that these differences were not significant at the .05 level. Table 7 presents the

means and standard deviations for the tonal pretest for both control and experimental groups.

Table 7

Means and Standard Deviations of the Tonal Pretest

Group	Mean	Std. Deviation	N
Experimental	27.63	6.85	72
Control	28.46	7.00	69
Total	28.04	6.91	141

Means and Standard Deviations of the Tonal Posttest

The experimental group began with a lower mean on the tonal subtest scores of PMMA than the control group (see Table 7). After the 12-week period of treatment, the experimental group achieved a higher mean than the control group (See Table 8). The standard deviation for the control group was larger than the experimental group, indicating a greater variability of scores in the control group.

Table 8

Means and Standard Deviations of the Tonal Posttest

Group	Mean	Std. Deviation	N
Experimental	31.44	5.45	72
Control	30.41	7.36	69
Total	30.94	6.45	141

Repeated Measure of Multivariate Analysis of Tonal Aptitude Gains Scores

Repeated measures of multivariate analysis (Mehren & Lehmann, 1991) were conducted to determine whether Taiwanese first grade students who received music instruction based on a Music Learning Theory-based curriculum gained more in developmental tonal aptitude than students who received the traditional Taiwanese curriculum. The results for this comparison are found in Table 9.

Table 9

Repeated Measures of Multivariate Analysis of Tonal Aptitude Gains Scores

Effect	Value	F	Hypothesis df	Error df	Sig.
Tonal	.208	36.464	1.000	139.000	.000***
Tonal x Group	.027	3.872	1.000	139.000	.051

***($p \leq .05$)

After the 12 weeks of instruction, both groups achieved significantly higher mean scores on the tonal posttest. However, there was not a significant difference between the gains of the two groups, although the difference between groups neared significance in favor of the experimental group.

Interpretation of Tonal Aptitude Gains Scores

The developmental tonal aptitude of both groups increased, regardless of instructional approach. Apparently, appropriate instruction, based either on the a Music Learning Theory-based curriculum or the traditional Taiwanese curriculum, will benefit the developmental tonal aptitudes of Taiwanese first grade students, because they are able to consistently audiate tonal patterns as a result of engaging in singing activities, regardless of curricular context.

When compared with the control group, the gains in developmental tonal aptitude scores for the experiment group were not statistically significant, although they approached significance. The experimental group started with a lower mean than control group in the pretest (see table 7) and ended in a higher mean in posttest (see table 8). This suggests possible practical significances, which may accounts for the gains in tonal means scores of the experimental group. The gains in the experimental group tend to support the use of music instruction that includes a vast variety of tonalities as suggested in the *Jump*

Right In curriculum.

Perhaps the differences of the gains between groups were not significant due to the length of the treatment or the frequency of instructional time during the study. The present study was conducted over a consecutive 12-week period. A longer treatment period possibly would have resulted in significant differences. Also, classes were held once per week for forty minutes. Possibly, a schedule of two classes per week might have resulted in significant differences, as the instruction would have been reinforced more regularly.

The Analysis of Rhythm Aptitude Scores

Means and Standard Deviations of the Rhythm Pretest

The control group (n=69) and the experimental group (n=72) were examined for evidence of preexisting differences on developmental rhythm aptitude as measured by the rhythm subtest of PMMA. Means and standard deviations of the rhythm pretest for both the control and experimental groups are reported in Table 10. The means of the rhythm pretest scores were similar for both groups. The result of a two-tailed T-test conducted on the means score indicated that these differences were not significant at the .05 level. The standard deviation of the control group was somewhat larger than that of the experimental group, indicating a greater variability of scores within the control group.

Table 10

Means and Standard Deviations of the Rhythm Pretest

Group	Mean	Std. Deviation	N
Experimental	25.62	4.93	72
Control	25.72	5.59	69
Total	25.67	5.25	141

Means and Standard Deviations of the Rhythm Posttest

The means and standard deviations for the posttest scores of the PMMA Rhythm subtest are presented in Table 11. The mean score of the experimental groups (n=72) was higher than that of the control group (n=69) on the posttest. Standard deviations for both groups were similar, indicating that the variability of scores in these two groups were almost identical. After the 12 weeks of treatment, the experimental group mean scores for the Rhythm posttest were similar to those of the pretest; however, the mean scores of the control group decreased.

Table 11

Means and Standard Deviations of the Rhythm Posttest

Group	Mean	Std. Deviation	N
Experimental	25.82	5.43	72
Control	23.68	5.47	69
Total	24.77	5.45	141

Repeated Measures of Multivariable Analysis of Rhythm Aptitude Gains Scores

Repeated measures of multivariate analysis were conducted to determine whether Taiwanese first grade students who received music instruction based on a Music Learning Theory-based curriculum gained more in developmental rhythm aptitude than students who received the traditional Taiwanese curriculum. The results for this comparison are found in Table 12.

Table 12

Repeated Measures of Multivariable Analysis of Rhythm Aptitude Gains Scores

Effect	Value	F	Hypothesis df	Error df	Sig.
Rhythm	.025	3.564	1.000	139.000	.001***
Rhythm x Group	.036	3.872	1.000	139.000	.001***

*** ($p \leq .05$)

The F coefficients for both the over-all gains and the Rhythm x Group variable were significant. Students who received instruction based on Music Learning Theory had significantly larger gain scores than those who received instruction using the traditional Taiwanese curriculum. This implies that the treatment had a significant effect on the Taiwanese first grade students' developmental rhythm aptitudes, which might be directly related to the choice of music curriculum.

Interpretation of Rhythm Aptitude Gains Scores

There was a significant difference in the developmental rhythm aptitude gain scores, favoring the experimental group. This suggests that the treatment was a significant variable. However, the significant difference did not result from the progress made by the experimental group. The mean scores of the experimental group for the rhythm pretest and posttest were approximately the same. The decrease of mean scores for the control group was the primary reason accounted for the significant difference.

There are several factors that may have caused the decrease in the mean score of rhythm aptitude posttest for the control group. These factors include simplicity of the rhythm patterns within the song repertoire, the absence of Gordon's learning sequence activities, and an omission of movement activities.

First, the lack of variety of rhythm patterns in the songs taught could have accounted

for the decrease in the rhythm posttest means for the control group. All nine songs taught in this study were in duple meter and without rhythmic divisions and elongations. With the absence of diverse rhythmic exposure, children would not benefit from the taxonomy of rhythms that lead to discrimination among rhythmic patterns. Therefore, with a supportive and rich metric environment, it is possible that the children in this study would have benefited to a greater degree.

Moreover, without the enhancement of learning sequence activities, through which students learn a large variety of rhythm patterns in both duple and triple meters, the diversity of rhythm exposure of the control group was limited. After the 12-week period of instruction, the absence of diverse meters might have created a disadvantage for the control group. This might have affected their performance on the rhythm posttest.

Another reason that might possibly account for the decrease for the control group scores was the lack of movement activities. The teacher's manual of the Arts and Humanities Domain used in this study does not suggest movement activities. In this study, the students in the control group, who represented the traditional Taiwanese music curriculum, engaged in more notation recognition activities than movement. Movement has been shown to increase developmental rhythm aptitude (Moore, 1987) and the absence of movement activities in the Taiwanese curriculum may have affected the scores for the

control group.

After the 12-week period of treatment, there was a slight increase in the developmental rhythm aptitude scores of the experimental group. A factor that might have caused this phenomenon may be the incorporation of movement activities suggested by a Music Learning Theory-based curriculum. However, the teacher in this study reported that, for the experimental group, there was a lack of necessary classroom space needed for movement activities. Thus, the experimental group found these activities extremely challenging. Every time the experimental group engaged in movement activities, they needed to rearrange the classroom in order provide appropriate space for participation. It is possible that more space would have resulted in better quality movement and higher rhythm aptitude scores.

Also, the large number of students within each class might have affected the success of the treatment. There were 36 students in each class. Although the movement activities were taught during each period with the experimental group, insufficient classroom space for movement and the large number of students per class may have hindered the development of rhythm aptitude.

Another reason for the slight progress achieved by the experimental group could be the length of the treatment. Possibly, a longer treatment might have resulted in greater

gains. Sessions in this study lasted forty minutes per week during a 12-week instructional period. Extension of the treatment may have resulted in higher developmental rhythm aptitude scores.

The Analysis of Singing Performance Scores

Means and Standard Deviations for Singing Performance

Presented in Table 13 are the means and standard deviations for the singing performance scores on tonal accuracy, rhythm accuracy, intonation accuracy, and the composite scores. The composite score for each student was obtained by dividing the sum of three dimension scores from the judges by three. The students in the experimental group (n=72) sang with slightly better tonal accuracy and rhythm accuracy on the criterion song than students in the control group (n=69). Standard deviations for both groups were similar. The mean scores of both groups also exhibited similar trends in intonation accuracy. The composite mean score for the experimental group was slightly higher than that of the control group. The standard deviations for the composite scores of both groups were similar. However, for both groups, the mean scores in each dimension and composite scores are higher than theoretical means (3.0), and the standard deviations of the composite scores were smaller than theoretical standard deviations (2.0).

Table 13

Means and Standard Deviations of Singing Performance

	Experimental (N=72)		Control (N=69)	
	Mean	SD	Mean	SD
Tonal Accuracy	3.69	.80	3.12	.81
Rhythm Accuracy	3.78	1.06	3.27	.95
Intonation Accuracy	3.67	.93	3.58	.76
Composite Scores	11.16	1.84	9.96	1.80

T-test of Singing Performance Ratings

In order to determine whether Taiwanese first grade students who received Music Learning Theory-based curriculum performed a criterion song better than those who received the traditional Taiwanese based curriculum, a two-tailed T-test for each dimension was conducted. The dimensions included in this analysis consisted of tonal accuracy, rhythm accuracy, and intonation accuracy. In addition, a two-tailed T-test was performed on the composite scores. The data for these comparisons are found in Table 14. Even though the mean trends all favored the experimental group, there were no significant differences between the experimental group and the control group on the singing performance rating scores ($p \leq .05$).

Table 14

T-test Table for Tonal Accuracy, Rhythm Accuracy, Intonation Accuracy, and Composite

Scores

	Sum of Squares	Df	Mean Square	T	Sig.
Tonal accuracy	.38	1	.38	.057	.811
Rhythm accuracy	.12	1	.12	.011	.915
Intonation	.27	1	.27	.367	.545
Composite	.20	1	.020	.055	.815

($p \leq .05$)

Interpretation of Singing Performance Test

There are several factors that could account for the non-significant differences between the experimental and control groups. These factors include: 1) a lack of experience singing alone, 2) the overall size of the classes, 3) the length of the 12-week treatment period, 4) preexisting differences in singing performances among students, 5) the number of criterion songs used for analysis, and 6) the low difficulty level of the selected criterion song.

When administering the singing test, the teacher reported that many children in both groups experienced difficulty performing in solo, which was necessary for assessing singing performance and audiation skill development. This may have affected the integrity

of data. Due to the large class sizes in each group, the children did not have many opportunities to sing alone prior to data collection. Thus, the teacher did not have opportunities to determine whether each child used his/her singing voice appropriately. Although logistics of the singing performance test were explained to all students before test administration, many children felt uncomfortable singing by themselves into an audio tape recorder. Thus, data may not accurately represent the singing achievement of the Taiwanese first grade students. When the children performed the song in a group as a part of classroom activities, they enjoyed singing the song and performed exceptionally well. However, when asked to sing the song alone for data collection, the students did not enjoy performing and henceforth did not perform well. The data recorded from the solo singing portion of the test, therefore, may not appropriately portray the potential of Taiwanese first grade students due to their apprehension and anxiety when asked to sing in solo.

There were valid reasons for the particular design used for this study. Yet, the exclusion of a singing performance pretest in this study signifies that there was no way to measure preexisting differences in the individual singing abilities between the two groups. Measuring preexisting singing abilities of the Taiwanese first grade students would have been extremely difficult logistically. However, the inclusion of a singing performance pretest in the design of the study might have uncovered differences between the groups at

the commencement of the study, which may have affected the analysis.

The criterion song *Happy New Year* (Appendix F) was chosen because Taiwanese children enjoy the playful activities that accompany the song. The criterion song consists of sixteen measures and is in major tonality and duple meter. The lack of tonal and rhythmic variety within the song, as well as the length of the criterion song, may have affected the results. In addition, the extremely simple structure of the criterion song failed to differentiate between the various performance abilities of first grade Taiwanese students. This is reflected in the observed means being greater than the theoretical means. The rhythmic structure paired with the simplistic melodic line of the criterion song represented the type of song repertoire used in the traditional Taiwanese music curriculum. Yet, it appears that the oversimplified structure of the criterion song did not challenge the students with high aptitudes and therefore was not able to accurately represent the singing abilities of Taiwanese first grade students.

In addition, the teacher reported that the length of the criterion song may not have been developmentally appropriate for first grade students and might have affected their singing performance. According to the teacher, it was difficult for the students to maintain focus when singing the criterion song without piano accompaniment, and the length of the criterion song might have resulted in a lack of concentration during testing session. The

Happy New Year song may be a good song to meet instructional objectives, but it appears that its use as a criterion song to measure individual singing performance may have been insufficient.

The Comparison of PMMA Scores between Taiwanese and American First Grade Students

Means and Standard Deviations for Taiwanese Students and American Students

Table 15 contains the means and standard deviations for the pretest PMMA scores of the Taiwanese first grade students and the PMMA scores of American children as reported in the PMMA Manual. All of the means were lower for the Taiwanese students than those of the American children. The standard deviations of the Taiwanese children were greater than those of the American students.

Table 15

Means and Standard Deviations for Taiwanese and American Students

	Taiwanese (N=141)		American (N=202)		t Value
	Mean	SD	Mean	SD	
Tonal	28.04	6.9	29.8	5.03	2.589***
Rhythm	25.67	5.25	25.8	4.34	0.254

($p \leq .05$)

A two-tailed T-test was conducted to compare the Taiwanese and American tonal scores. American students scored significantly higher than Taiwanese students on the tonal

dimension of PMMA. Results of the two-tailed T-test on the rhythm means indicated no significant difference between Taiwanese and American first grade students.

Interpretation of the Comparison between Taiwanese and American Students

Chuang (1997) found that both stabilized tonal aptitude and rhythm aptitude scores of Taiwanese students were higher than those of the American student. She attributed this to the variety of tonal stresses, duration of pitches, and intonation of the Chinese language. Because of the strengthened perceptions of pitch variations within the Chinese language, it is possible that the identification and discrimination of tonal phonemes among Chinese speakers were easier than for English speakers. However, this study does not indicate that first grade students of tonal languages have higher developmental tonal aptitudes than non-tonal, language-based first grade students.

Reasons for the different findings in this study may be attributed to 1) the content validity of the tonal subtest of PMMA for Taiwanese first grade students, 2) the type of music aptitude tests given to the students, 3) the number of the sample populations involved in both studies, 4) the developmental music levels of the sample populations, and 4) the language interface used in the PMMA test tape in this study.

The results of this study indicated that there was a significant difference in PMMA tonal subtest scores between Taiwanese and American first grade students, with Taiwanese

first grade students scoring significantly lower than American first grade students. The content validity of the PMMA tonal subtest might be the factor that caused this significance.

Most Taiwanese music is either in pentatonic or in major tonality. The population in Taiwan is more homogeneous than that of America, and the musical environment in which Taiwanese children grow up consists of tonal structures mainly inherited from ancient Chinese music culture, which is distinguished from Western cultures. The 40 test items of the PMMA tonal subtest were designed based upon American musical perspectives and might not be valid for investigating the developmental tonal music aptitude of Taiwanese children. Further research is needed to examine the content and predictive validity of PMMA Tonal subtest for the use in Chinese music culture.

Most research indicates that students of the same age from Korea, Finland, Taiwan, and Germany attained higher tonal aptitude scores than students from the United States (Chuang, 1997; Schoenoff, 1972; Sell, 1976; Jung, 1990). However, the students in these studies were given the *Music Aptitude Profile* (MAP), which is designed primarily for fourth through twelfth grade students. In this study, Taiwanese and American first grade students' developmental music aptitudes were compared using PMMA. Prior to this study, there was no research that focused on the comparison of PMMA scores between different

cultures. The comparison of music aptitudes between Taiwanese and American students is a pilot study, and therefore, requires further research to confirm the data obtained in this study.

Also, the population samples in the MAP studies contained over 1,000 students of varying grade levels (Chuang, 1997; Schoenoff, 1972; Sell, 1976). In contrast, the size of the sample population used in this study consisted of only 141 students. The comparison of the data obtained in this study should not be compared to the data obtained in the previous MAP studies due to the varied sizes of the samples. The small size of this study's sample may have influenced the data outcome.

Moreover, MAP is designed to measure the stabilized music aptitudes of fourth through twelfth graders. PMMA measures the developmental music aptitudes of kindergarten through third graders. In previous studies, the Korean, Finish, Taiwanese, and German students were tested after their music aptitude stabilized. Students in this study represent the other end of the spectrum. These students were beginning formal instruction at the first grade level, but they were still in the developmental stages of music aptitude. The difference in developmental levels between the two studies may explain the differences in performance scores for Taiwanese first grade students.

The difference in performance scores may also be attributed to the PMMA Manual

tape, which is only available in English. Although the researcher translated the individual items on the tape during the administration of the exam, the students were exposed to a foreign language and may have felt high levels of anxiety about taking a test that is not originally presented in their language. This may be particularly true when working with young students. Possible anxiety levels among students, because they were exposed to a different language, may have affected the time allotted for audiation. Students were required to listen to two separate criterion elements, the original tape in a foreign language and the translation of the test items. They might have lost focus during the period of translation or felt rushed to answer the questions. Furthermore, because the researcher translated the test items during the test, it is believed that the process validity may have been affected since the original PMMA Manual used in this study was not produced with the intention of translation. Therefore, the lower performance scores for Taiwanese first grade students on PMMA tonal subtest may not adequately represent the potential of Taiwanese students in the developmental music aptitude stage.

CHAPTER 5

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary of the Study

Purposes and Problems

The primary purpose of this study was to investigate the relative effects of the use of music instruction based on the traditional Taiwanese curriculum and music instruction based on Gordon's Music Learning Theory on the development of music aptitudes and singing achievement of first grade Taiwanese students. The specific problems of the study are the following:

- (1) To determine whether Taiwanese first grade students who receive Music

Learning Theory-based instruction will have different developmental tonal aptitude scores on PMMA than students who receive instruction based on the traditional Taiwanese curriculum.

- (2) To determine whether Taiwanese first grade students who receive Music

Learning Theory-based instruction will have different developmental rhythm aptitude scores on PMMA than students who receive instruction based on the traditional Taiwanese curriculum.

- (3) To determine whether Taiwanese first grade students who receive Music

Learning Theory-based instruction will demonstrate different levels of singing achievement than students who receive instruction based on the traditional Taiwanese curriculum.

- (4) To compare Taiwanese first grade students' scores on PMMA to those of standardization norms as reported in the PMMA Manual.

Procedures

The sample for this study consisted of 141 Taiwanese first grade students from four intact classes in one elementary school. The classes were randomly assigned to one of two groups. Two classes constituted the control group and received music instruction based on the traditional Taiwanese Curriculum. The remaining two classes constituted the experimental group and received music instruction as suggested in a Music Learning Theory-based curriculum. PMMA was administered to both groups by the researcher during the first week of the study as pretest.

The students in both groups received one 40-minute music class per week for 12 weeks. Singing repertoire (see Appendix C) for both groups were identical, except that the control group was taught using teaching strategies suggested in the traditional Taiwanese Curriculum and the experimental group was taught with the teaching strategies suggested in *Jump Right In: The Music Curriculum*. In addition, the experimental group was exposed

to songs in various tonalities and meters without being asked to sing them.

At the end of the 12-week instructional period, PMMA was administered again to both groups as posttest. In addition, all students were individually audio-taped performing the criterion song *Happy New Year*. Three independent judges using a three-dimensional rating scale developed by the researcher rated their performances.

Analysis

Means, standard deviations, and split-half reliabilities were computed for both *Tonal* and *Rhythm* subtests of PMMA pretest and posttest scores, as well as the means, standard deviations, and reliabilities for the singing performance ratings of both groups.

In order to determine whether Taiwanese first grade students who were taught using a Music Learning Theory-based curriculum had different gains in developmental tonal aptitude than students who were taught using the traditional Taiwanese curriculum, repeated measures of multivariate was conducted on scores on the tonal subtest of PMMA. To determine whether Taiwanese first grade students who were taught using a Music Learning Theory-based curriculum had different gains in developmental rhythm aptitude than students who were taught using the traditional Taiwanese curriculum, repeated measures of multivariate was conducted on scores on the rhythm subtest of PMMA. To determine whether Taiwanese first grade students who were taught using a Music Learning

Theory-based curriculum demonstrated different singing performances than students who were taught using the traditional Taiwanese curriculum, two-tailed T-tests were computed for each dimension of a rating scale used to rate the performances of the criterion song. To investigate differences between Taiwanese and American students on PMMA, T-tests were computed to compare the PMMA pretest mean scores of Taiwanese first grade students to those as reported in the PMMA Manual.

Results and Conclusions

Results indicate that both groups exhibited significant gains in developmental tonal aptitude after 12-week of treatment, regardless of the instructional method used in this study. The experimental group pretest score on the tonal subtest was lower than that of the control group. However, on the posttest, the experimental group tended towards higher mean scores on the tonal subtest. The researcher suggests that there may be practical significance in favor of Music Learning Theory. Also, the trend of this study supports the use of music instruction that includes a wide variety of tonalities as suggested in the *Jump Right In* curriculum.

Students who received instruction based on Music Learning Theory had greater gains in their rhythm aptitudes than did students who received instruction based on the traditional Taiwanese music curriculum. The developmental aptitude of the experimental group

approximately remained the same before and after the treatment. However, the developmental rhythm aptitude of the control group decreased during the treatment. The decrease of the scores of the control group might have been a result of several factors, including a lack of variety in rhythm patterns within the songs, an absence of learning sequence activities, an omission of movement activities that encourage rhythmic development through kinesthetic awareness, and the length of treatment sessions.

There were no differences in the singing performances between the control group and the experimental group. However, all means of the Music Learning Theory-based group tended to be greater than those who received instruction based on traditional Taiwanese curriculum. It is possible that no significant differences were found because of a general lack of solo singing experience among the first grade Taiwanese students, difficulties performing individual singing requirements during testing, and the inability of the teacher to assess individual singing progress and adapt instruction to individual needs due to large class sizes.

Also, the lack of rhythmic and melodic variety along with the length of the criterion song may have attributed to the similarities between groups. The difficulty of the criterion song was not appropriate for distinguishing the various singing abilities of the Taiwanese students. The song was too long for the students to maintain focus when singing alone

without piano accompaniment, which might have resulted in a decrease in concentration during the testing period.

Primary Measures of Music Adjudication (Gordon, 1986) possibly is a valid developmental music aptitude test with a high reliability for Taiwanese first grade students in this study. The tonal scores of Taiwanese students were significantly lower than those reported in the PMMA Manual for American students. This might result from the different music cultures in the two countries. Therefore, Taiwanese first grade students might require a different set of norms on the tonal subtest. Further research is needed in order to investigate the content and predictive validity of the PMMA tonal subtest for the use with Taiwanese population.

Implications for Music Education

Results regarding the effect of the use of traditional Taiwanese curriculum and Music Learning Theory-based curriculum revealed that both curricula increased the developmental tonal aptitudes of Taiwanese first grade students. However, the tendency of the results was in favor of the Music Learning Theory-based curriculum. The traditional Taiwanese music curriculum does not provide music of varied tonalities. Taiwanese music educators might need to collect songs in different tonalities from different resources and expose their students to tonalities besides pentatonic, major and minor. Likewise, tonal

pattern instruction that contains a sequential content in various tonalities should be included within general music instruction.

The use of Music Learning Theory-based curriculum is more supportive of the developmental rhythm aptitude of Taiwanese first grade students than the Taiwanese curriculum. The singing repertoire included in Taiwanese curriculum should contain a wide variety of metric division and elongations. A supportive and rich metric repertoire may help a child's developmental rhythm aptitude progress towards reaching his/her musical potential and remain at that level for the rest of his/her life. The Taiwanese teacher's manual used in this study did not provide suggestions and practical activities to achieve the goals and objectives regarding kinesthetic development that were indicated in national standards for the music unit. It is essential for Taiwanese students that music teachers adopt activities like those suggested in *Jump Right In* and use music learning sequence activities to promote developmental rhythm aptitude. Taiwanese music teacher education, therefore, should provide opportunities during pre- and in-service teacher instruction that revolve around enhancing theoretical understanding and practical skills necessary for incorporating movement and a variety of meters.

Results of this study found no differences between the effects of the two curricula on singing performance. However, in the semester this study was conducted, there was a total

of nine songs used that were drawn from the traditional Taiwanese curriculum. The musical content presented in the repertoire did not appear to enhance children's learning experiences. Curriculum manuals in Taiwan should consider enlarging the numbers of songs in the repertoire to include more than nine songs per semester. Jarjisian (1981) recommends using tonal pattern instruction to enhance children's singing achievement. She believes that instructional content and tonal aptitude are greater influences on singing achievement than teacher, school environment, or socio-economic status. Therefore, tonal pattern instruction may be a useful teaching strategy for facilitating children's singing abilities. Teachers should provide more individual singing opportunities for the students within group activities. This may increase the likelihood of developing confidence in solo singing ability. Also, the class size of Taiwanese general music classes seems too large for music teachers to pay enough attentions for each child's individual needs. Gordon (1997b) suggests that it is best to have no less than eight and no more than twenty-four children in a music class. Reduction of music class sizes not only makes it possible to increase individual singing opportunities but also provides more space for movement.

Primary Measures of Music Audiation may be a valid developmental music aptitude test with a high reliability for Taiwanese first grade students in this study. Therefore, music teachers in Taiwan should use PMMA to measure their students' developmental music

aptitude levels and use the information gained from PMMA to improve instruction. Also, parents can use the information gathered from PMMA test results to better understand the musical needs of their children. A standardization norm based on the Taiwanese population might help the information gathered from PMMA to be more useful in Taiwan.

Recommendations for Future Research

At the end of the 12-week treatment period, since the tonal developmental gains between the experimental and the control groups were nearly significant, further research is needed to investigate whether the differences exist. The study could be replicated by extending the length of treatment.

Furthermore, when replicating this study the researcher might use two or three songs of different tonalities and meters as the criterion measure. Students learn to identify tonalities by differentiating between what something is and what it is not. By including criterion songs of different tonalities, the researcher may be able to discern the singing abilities of the students to a greater degree. Because this age level of students might not be able to maintain their focus for a long time, it is suggested that the criterion songs should be short. Also, the study might be redesigned to allow the researcher measure both the pre- and the post-existing singing abilities and differences among students.

Researchers might find it beneficial to replicate and extend the rhythm portion of

this study in order to determine the rate of atrophy that the control group would experience when instruction continued with the traditional Taiwanese curriculum.

In relation to using PMMA with Taiwanese students, a significant difference was found while comparing the developmental tonal aptitudes of Taiwanese and American first grade students. Further research is needed in order to understand whether the significance resulted from the language interface of the PMMA tape or from the content validity of PMMA tonal subtest.

The developmental aptitudes of Taiwanese first grade students in this study are lower than those of the American students. However, in Chuang's (1997) research, the results suggested that the stabilized music aptitudes of Taiwanese fourth students are higher than those of the American students. The subjects of this study were in first grade and had one 40-minute music lesson per week using 2001 version of traditional Taiwanese music curriculum. The youngest age level in Chuang's study was fourth grade, and these students had two 40-minute music lessons per week using old version of music curriculum. Future research that traces the sample used in this study and investigates their stabilized music aptitudes in fourth grade might provide information regarding the effects of frequency of music instruction and the effects of the newest version of music curriculum that these children will engage in the following years. Also, when replicating this study, a larger

sample size that reflects the Taiwanese population is recommended.

In addition, the language interface of PMMA might be adjusted to represent the Chinese population. It is suggested that PMMA should be recorded with Chinese test items to increase the probability of process validity. In this study the researcher translated the PMMA directions, but did not translate the test item labels of the original PMMA test tape into Chinese. Using a PMMA tape that contains Chinese test items may result in different scores. A future researcher should use the results of the Chinese version of PMMA and the results of American norms to compare the difference in developmental music aptitudes. This might provide more precise data of the PMMA norms among Taiwanese and American first grade students.

Appendix A

The Outline of Instruction for the Experimental Group

Tonal Syllable System: Movable *do* system with *la* based minor

Rhythm Syllable System: Beat function rhythm syllables

Procedure

Learning Sequence Activities (10-12 minutes)

Tonal Register Book 1, Unit 1 and Unit 2 (1st, 3rd, 5th, 7th, 9th, and 11th week)

Rhythm Register Book 1, Unit 1 and Unit 2 (2nd, 4th, 6th, 8th, 10th, and 12th week)

Skill Level: Oral/Aural (1st-6th weeks), Verbal Association (7th-12th weeks),

Sample of Representative Classroom Activities (28-30 minutes)

1. Go and Stop (4-7 minutes)

Students moved to macrobeats and microbeats while the teacher performed rhythmic chants.

2. Song repertoire instruction (12-15 minutes)

Reviewed the song taught in previous classes or taught a new song. The songs taught in this section were designated in the Taiwanese teacher's manual. When teaching a

new song, emphasis was placed on the teacher's demonstrations rather than students' performances. Whenever students in the experimental group sang a song at any point in the lesson, they also heard and sang the resting tone of the song to help establish tonal context. The teacher first demonstrated the whole song several times without instrumental accompaniment and notation. After extensive aural exposure to a new song was provided, students were then asked to sing the song phrase by phrase accompanied with movement to beat. Before the students were asked to sing, however, the tonality was established using a piano keyboard.

3. Jump Right In Activities (5-10 minutes)

Scarves, beanbag, or rhythm sticks were used when the teacher sang songs in various tonalities or chanted rhythm patterns in various meters. At the end of each performance, patterns were sung or chanted by the teacher, and the students were invited to echo the patterns individually or in group. If they chose not to respond, they were not forced to do so.

4. Move with music (5 minutes)

Students were invited to move freely to music played on the CD player. The teacher would occasionally stop the music for a short period of time, and the children froze movement when the music stopped. The music was drawn from a wide variety of

cultural sources and represented a variety of styles, tonalities, and meters.

5. Instrument Activities (5 Minutes)

Students used drums or Orff tonebar instruments to perform macrobeats or tonic ostinati while the teacher sang a song in various tonalities or meters.

Appendix B

The Outline of Instruction for the Control Group

Tonal Syllable System: Fix-*do* System

Rhythm Syllable System: Kodály beat duration system

Procedure

1. Song repertoire instruction (10-15 minutes)

Reviewed the song taught in previous classes or taught a new song. Songs taught in this section were designated in the Taiwanese teacher's manual. When teaching a new song, a piano keyboard was used to help students sing the note names shown in the textbook phrase by phrase with fixed-*do* system. After the melody was learned, words were added.

Emphasis was placed on students' performance rather than the teacher's vocal demonstration.

2. Music Reading (10-15 minutes)

Flash cards and chalkboard writing, including notes and rhythm patterns, were used to facilitate students' familiarity with notation. Kodály hand signs and rhythm syllables were also introduced.

3. Review the songs with notation. These songs were taught earlier in the lesson by rote.

4. Instrument Activities (10 Minutes)

Students used drums or Orff tonebar instruments to perform beat or tonic ostinati while the teacher sang Chinese folk songs. Students were not asked to learn to sing these songs.

Appendix C

Song Repertoire

1. Happy New Year	Major	Duple
2. Airplane	Major	Duple
3. Paper, Scissors, Stone	Major	Duple
4. Flying Train	Major	Duple
5. Hello Song	Major	Duple
6. A Top	Major	Duple
7. My Friends	Major	Duple
8. Spring Ox	Pentatonic	Duple
9. New Cloth	Pentatonic	Duple

Appendix D

Singing Performance Rating Scale

Performance will be rated from 1 to 5 (highest) for each dimension.

Tonal Accuracy (Check only one item which best described the performer's level)

- 5 The song was accurately performed with correct intervals, good intonation, and a sense of tonality throughout.
- 4 The song was performed with mostly correct pitches, melodic contour, and a sense of tonality.
- 3 The song was performed with approximate intervals, melodic contour, with some sense of tonality.
- 2 The song was performed with some pitch change but no sense of tonality.
- 1 The song was performed with the speaking voice.

Rhythm Accuracy (Check only one item which best described the performer's level)

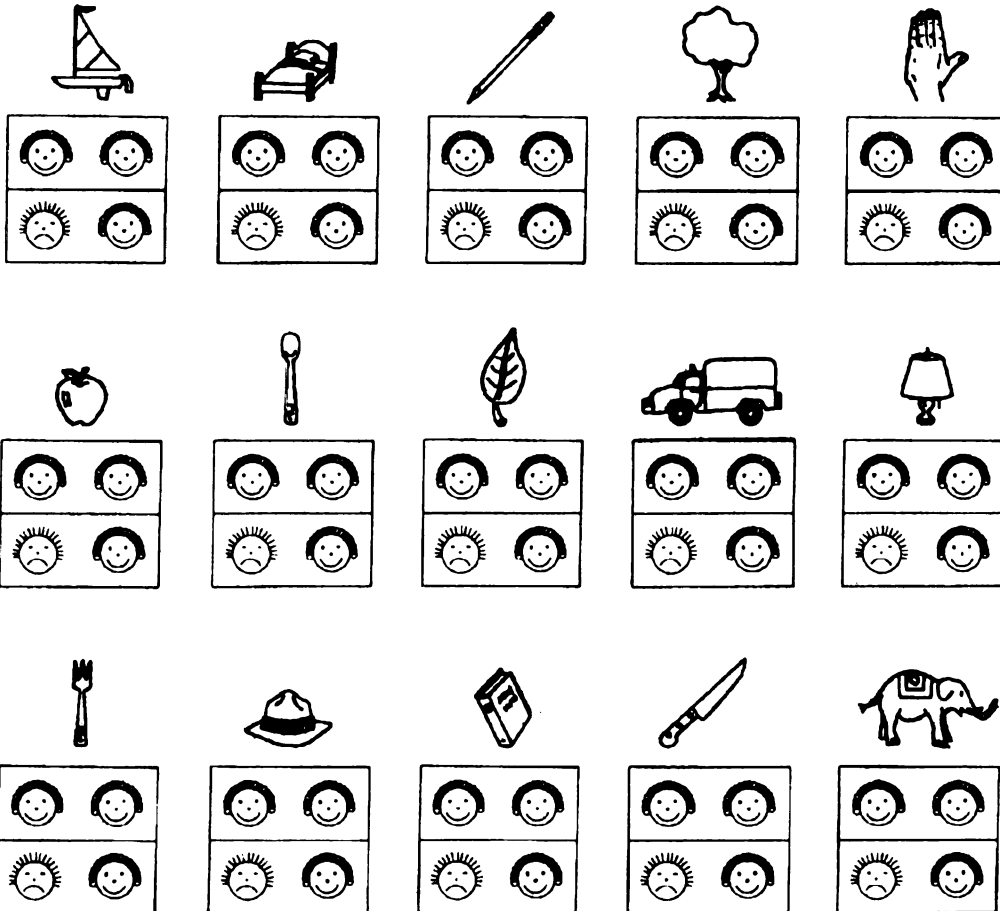
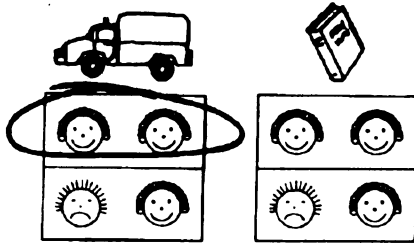
- 5 The song was accurately performed with accurate rhythm and consistent tempo.
- 4 The song was performed with mostly accurate rhythm and consistent tempo.
- 3 The song was performed with mostly accurate rhythm and somewhat inconsistent tempo.
- 2 The song was performed with mostly accurate rhythm and inconsistent tempo.
- 1 The song was performed with mostly inaccurate rhythm and inconsistent tempo.

Intonation Accuracy (Check only one item which best described the performer's level)

- 5 All notes are in tune and correct.
- 4 All note are in tune and most notes are correct.
- 3 Most of the notes are in tune and all notes are correct.
- 2 Most of the notes are in tune but not all notes are correct.
- 1 Most of the notes are out of tune.

Appendix E

Answer Sheet of Primary Measure of Music Audiation



Appendix F

HAPPY NEW YEAR



Appendix G

UCRIHS Permission

MICHIGAN STATE UNIVERSITY

June 26, 2001

TO: Cynthia TAGGART
204 Music Bldg.

RE: IRB# 01-435 CATEGORY: EXEMPT 1-C, 1-B, 1-C

APPROVAL DATE: July 2, 2001

TITLE: THE COMPARITIVE EFFECTS OF THE TAIWANESE NATIONAL
CURRICULUM AND A CURRICULUM BASED IN MUSIC LEARNING
THEORY ON THE DEVELOPMENTAL MUSIC APTITUDES AND SINGING
ACHIEVEMENT OF FIRST GRADE STUDENTS IN TAIWAN

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/ucrhs>

Sincerely,



Ashir Kumar, M.D.
Interim Chair, UCRIHS

AK: br

cc: Tao-Bin Yang
922 C. Cherry Lane
East Lansing, MI 48823



OFFICE OF RESEARCH AND GRADUATE STUDIES

University Committee on
Research Involving
Human Subjects

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E-Mail: ucrhs@msu.edu

*The Michigan State University
IDEA is Institutional Diversity:
Excellence in Action.
MSU is an affirmative-action,
equal-opportunity institution.*

Appendix H

Letter to the Principal

Dear Principal:

I am writing to ask permission for your students to participate in my research study, which is in fulfillment for the degree of Doctor of Philosophy in Music Education at Michigan State University. The purpose of my study is to gather information about the effect of the use of Edwin Gordon's Music Learning Theory on the development of tonal aptitude, rhythm aptitude, and singing achievement. I want to find out whether there is a difference in the development of music aptitudes and singing achievement between students who are taught with curriculum based on Gordon's Music Learning Theory and students who are taught with Taiwanese National Curriculum.

The study will be conducted over a 12-week period using four first grade classes in your school. The Tonal and Rhythm subtests of the *Primary Measures of Music Audiation* (PMMA) will be administered to students as a pretest and posttest. PMMA is a developmental music aptitude test designed by Edwin Gordon for children from grades K-3. In the Tonal and Rhythm subtests, the children will be asked to listen to each of the paired tonal or rhythm patterns to determine whether they sound the same or different.

Each subtest of PMMA will take about twenty minutes to administer. The scores of students who receive instruction based on Music Learning Theory will be compared to those of students who receive instruction based on the traditional Taiwanese curriculum. At the conclusion of instruction, students will perform one criterion song that will be recorded and rated by three independent judges to determine whether students who are taught using Music-Learning-Theory-based curriculum will perform better than students who are taught using the traditional Taiwanese curriculum.

Two classes will serve as the experimental group. Instruction for these classes will devote the first 10 minutes of each class period to Gordon's music learning activities. The other two classes will serve as the control group. They will receive music instruction without Gordon's music learning activities. Please know that both groups will continue to receive the same excellent instruction.

Participation is entirely voluntary and participants will be at no risk. All aspects of the student's performance will be kept confidential. If you approve my request to conduct this study, I will explain my study to the classroom teachers and students, and pass out a letter of explanation and an informed consent form to the students to bring home to their parents.

If you have question or concerns about this research you may call Tao-Bin Yang at (04) 723-1075 or via email: yangtaob@msu.edu. If you have any questions or concerns about

your rights in this research, you may contact David Wright, Michigan State University's

Chair of University Committee on Research Involving Human Subject at (517) 355-2180

or via email: ucrihs@msu.edu.

Sincerely,

Tao-Bin Yang

Appendix I

Letter to Parents

Dear Parents,

I am a music teacher in your child's school, Ping-Ho Elementary School. I am writing to ask permission for your child to participate in my research, which is in fulfillment for the degree of Doctor of Philosophy in Music Education at Michigan State University. The purpose of my study is to gather information about the effect of the use of Edwin Gordon's music learning sequence activity on the development of tonal aptitude, rhythm aptitude, and singing achievement. I want to find out whether there is a difference in the development of music aptitudes and singing achievement between students who are taught with curriculum based on Gordon's Music Learning Theory and students who are taught with Taiwanese National Curriculum.

The study will be conducted over a twelve-week period using four first grade classes. The Tonal and Rhythm subtests of the *Primary Measures of Music Audiation* (PMMA) will be administered to students as a pretest and posttest. The PMMA is a developmental music aptitude test designed by Edwin Gordon for grades K-3. In the Tonal and Rhythm subtests, the children will be asked to listen to each of the paired tonal or rhythm patterns to

determine whether they sound the same or different. Each subtest of PMMA will take about twenty minutes to administer. The scores of students who receive instruction based on Music Learning Theory will be compared to those of students who receive instruction based on the traditional Taiwanese curriculum. At the conclusion of the twelve weeks, your child will perform one criterion song that will be recorded and rated by three independent judges to determine whether students who are taught using Music-Learning-Theory-based curriculum will perform better than students who are taught using the traditional Taiwanese curriculum.

Two classes will serve as the treatment group and will devote the first 10 minutes of each class period to Gordon's music learning sequence activities. The other two classes will serve as the control group and will receive music instruction without Gordon's music learning activities. Please know that your child will continue to receive the same excellent instruction in both treatment groups and will continue to grow musically.

Participation is entirely voluntary and participants will be at no risk. All aspects of your child's performance will be kept confidential. I hope you will approve your child's participation in my study, and you can indicate by signing and returning the attached consent form. Once I have your permission, I will explain the study to your child and he/she will have the option of participating or not. Your child can also withdraw from the

study at any time with no educational consequences.

If you have any question or concerns about this research you may call Tao-Bin Yang at (04) 723-1075 or via email: yangtaob@msu.edu. If you have questions or concerns about your rights in this research, you may contact David Wright, Michigan State University's Chair of University Committee on Research Involving Human Subject at (517) 355-2180 or via email: ucrihs@msu.edu.

Sincerely,

Tao-Bin Yang

Appendix J

Parental consent form

Please return this form to Tao-Bin Yang if you consent to your child's participation in this study.

You have read the attached explanation of the Mr. Yang's Study on the comparative effect of the traditional Taiwanese curriculum and a curriculum based in Edwin Gordon's Music Learning Theory. Your child will not be allowed to participate in Mr. Yang's research without the assents of your child, classroom teacher, and you are collected completely. Participation in this study is voluntary. Your child is free to withdraw from the study at any time without penalty. Your child's performance will remain confidential in this study and that his or her verbal assent will be obtained as a precondition of participating in this study. Also your child's name will not appear in any report of the results. Within these restrictions, when the study is completed the overall results of it will be made available to you upon written request.

I agree to allow my child's participation in this research study

Child's Name: _____ Gender:

Class: _____ Teacher:

Parent or Legal Guardian's Signature:

Date:

Appendix K

Classroom Teacher Consent form

Please return this form to Tao-Bin Yang if you consent to your students' participation in this study.

You have read the attached explanation of the Mr. Yang's Study on the comparative effect of the traditional Taiwanese curriculum and a curriculum based in Edwin Gordon's Music Learning Theory. Participation in this study is voluntary. Your students will be allowed to participate in Mr. Yang's research only after students', parental, and your assents are collected completely. Your students' are free to withdraw from the study at any time without penalty. Your students' performance will remain confidential in this study and that his or her verbal assent will be obtained as a precondition of participating in this study. Also your students' name will not appear in any report of the results. Within these restrictions, when the study is completed the overall results of it will be made available to parents upon written request.

I agree to allow my students' participation in this research study

School:

Class:

Classroom Teacher's Signature:

Date:

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